OVERSEAS TRANSPORT AND TRADE

Enlarged Issue

MODERN TRANSPORT

Special Articles

"THE TIMES" OF THE TRANSPORT WORLD

VOL. LXXXI No. 2086 [Registered at the G.P.O. as a newspaper] LONDON, MARCH 21, 1959 PRICE NINEPENCE

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MODERN TRANSPORT

"THE TIMES" OF THE TRANSPORT WORLD

ST. LAWRENCE SEAWAY NEARS COMPLETION

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RURAL BUS OPERATION IN SPAIN

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VOL. LXXXI No. 2086 [Registered at the G.P.O. as a newspaper] LONDON, MARCH 21, 1959 PRICE NINEPENCE

Our Fortieth Anniversary

IN July, 1957, we celebrated in appropriate style the publication of our 2,000th issue, when we were honoured and gratified by a host of congratulatory messages. It would therefore be unbecoming so soon after that event to do more than record this week the fortieth anniversary of the founding of this newspaper. For it was on March 22, 1919, that MODERN TRANSPORT first saw the light of day, and there are some of our friends who have since continuously figured on our subscription lists and others who have regularly used our advertising columns. To them especially, and indeed to all our readers and advertisers, we convey our grateful thanks with the hope that we have given good value for money. It has taken two world wars to demonstrate that the rewards of victory are ephemeral, and we can recall the enthusiasm with which this paper was launched only four months after the Armistice of November, 1918. The outlook then was bright and the national barometer seemed set fair. But rejoicing was short-lived, the stimulus to trade proved artificial, the business of the country declined, and labour troubles culminated in the General Strike of 1926. The recent postwar years have also been a period of uncertainty. But we in our small world have plodded steadily on, largely no doubt because the principles upon which the paper was founded are fundamentally sound. This was to be an independent transport newspaper, covering happenings and developments in all forms of transport, rather than a journal dealing with one particular aspect of transport. Moreover, there have been so many exciting incidents and changes in our great industry, so much to report and so many facets on which to focus an expert eye that we could hardly help but succeed. It is common nowadays to talk about *transport* men. When we began we knew that the epithet was inevitable, although at the time railwaymen would not be bothered with road transport, and road transport men felt they had little to learn from railways. All that has since been changed by the march of events, and we confess to feeling some pride in the fact that we were first in the field to embrace the transport concept. We were closely followed, in August, 1919, by the Ministry of Transport, to which in recent years has been added civil aviation, and in November, 1919, by the Institute of Transport, for the foundation of which it was one of our earliest and most privileged tasks to solicit encouragement and support.

Nuclear Ship Possibilities

SO far as merchant ships are concerned the atomic age is not, as many believe, just around the corner. The annual report of Lloyd's Register of Shipping indicates that there is unlikely to be any rapid build-up in the number of nuclear-powered merchant ships owing to economic problems that remain to be solved. British thinking in this field, states the report, is aimed at an economic installation, offering at least some prospect of competition with conventional propulsion plant of proved reliability. Though reported likely to be uneconomical in operation, the U.S. *Savannah*, which will be at sea in 1960, will, however, provide the Americans with valuable operational experience—an important prelude to further advancement. Moreover, this pioneer ship will have an importance far beyond the bounds of national interest. She postulates questions of international significance such as safety arrangements in design and operation, the acceptance of nuclear ships in the ports of the world, disposal of waste products and insurance matters affecting owners' and governmental liability. The report states that during the year the United Kingdom Atomic Energy Authority continued its work in connection with the development of an advanced type of gas-cooled graphite moderated reactor. Under the aegis of the Civil Lord's committee, the Authority and the Admiralty are making, with the assistance of the industries concerned, a detailed appraisal of marine application of this and other types of reactor.

CURRENT TOPICS

Soon to Leave 55 Broadway

THE impending retirement of Sir John Elliot from the chairmanship of the London Transport Executive (announced after we had gone to press last week) marks the departure from the daily transport scene of one of its most colourful, popular and versatile figures. Those who, like ourselves, have enjoyed the friendship of this gifted man since 1925, when the astute Sir Herbert Walker chose him for the urgent task of restoring public relations on the Southern, must have admired his energy and pertinacity, as well as the courage with which he has handled difficult situations. Sometimes the odds have been against him, but he has faced them all with infinite resource and humour. Transport, as many of us know, is a fascinating business and, as such, is apt to make excessive demands on its adherents. Sir John has wisely chosen to turn to other and perhaps more agreeable pursuits while there is time and inclination to enjoy them. He would like, while still young enough, to take more time for travel and to indulge in more historical research, such as his study of the French Revolution, and to write about it. No doubt he will still be fully occupied—he is not the sort to sit back—and it is significant that he already holds directorships with Thomas Cook and the Pullman Car Company, with both of which he has been in close touch during most of his railway career. One usually joins the railways on leaving school or university; not so Elliot, who had pursued an Army career at first and had done a useful spell in Fleet Street before joining the Southern and was therefore fitted to fulfil the special task assigned to him by Walker. He had still to learn the art of railway administration and operation, but hard work, honesty of purpose, determination and the quick perception of the trained journalist combined to get him quickly to the top. Other qualities, like sincerity and friendliness, soon endeared him to his new colleagues and have since gained for him despite some local and temporary discordance, goodwill amongst all ranks of the service. As chairman of London Transport he has made financial arrangements for extensive railway rolling stock renewal, electrification of the Central Line to Ongar and the Metropolitan beyond Rickmansworth and trolleybus replacement; he has ably led the management team in a period of traffic recession.

A Complex Trusteeship

OUR foreign friends, looking at the not-too-logical structure of transport in Britain, might well fail to understand its complexities. The British Transport Commission, for example, embraces the undertaking of the former London Passenger Transport Board, which is, however, managed by an Executive independently appointed by the Minister of Transport. With British genius for making things work this has gone smoothly during the decade or more of nationalisation and the correspondence now published between Sir John Elliot and Sir Brian Robertson, chairmen of Executive and Commission respectively, shows the friendly relations and mutual confidence which exist. London Transport Executive members extend loyalty to the Commission while making independent judgments on behalf of the London undertaking; on the other side the Commission holds a light rein rather than a dictatorship. Sir John's decision to retire, made nearly two years ago with a view to taking up other pursuits while still endowed with energy and zest, raises the question whether the chairman of the L.T.E. should be also a member of the Commission. One of the strengths of Sir John's position has been that he has been able to put the whole of his energies into his work for London, while being loyal to the Commission, without the distractions of overall Commission responsibilities; on the contrary there are virtues to be discerned in the chairmanship of the Commission's components, such as the L.T.E. or area boards, being in the hands of members, full or part-time, of the Commission itself, who are thus able to transmit the spirit of B.T.C. policy to the delegated undertakings. It will be interesting to see how this matter is resolved.

The Underground Movement

FOR a long period in the nineteenth century London was the only city where traffic congestion on the surface justified an underground railway system. Today there is a positive underground railway mania spreading round the world, no doubt hugely stimulated by the plans of the former Paris Metropolitain company for lines in the great cities of South America, Canada and India. Details of the Rotterdam project are now available. The shallow subway idea has been embraced by Swiss cities and by Milan, the industrial capital of Italy, in the past few months. Now Kiev, capital of the Ukraine and third city of Soviet Russia, proposes to build a system. Engineers from China are at present in East Berlin to study that city's underground system to obtain ideas for a network which it is intended to build in the capital city of Pekin. Yet another city to plump for an underground railway is Brazilian São Paulo, with a 1¾ million population, where previously consideration had been given to an Alweg system. The Prefect of the city has now announced plans for a subway 6.8 miles in length; this will form the basis for a network of several lines to be built later. Only London, the pioneer, seems to be left behind, despite powerful advocacy of the merits of the Victoria Line.

Another Special Road Programme

INITIATING a House of Commons debate on the supplementary estimates on the allegedly inadequate road construction programme, the Opposition did not really achieve a great deal on Tuesday save provide the Minister of Transport with an opportunity to announce a small special road programme in areas where there were unemployment difficulties. So far schemes costing more than £2½ million had been authorised and had started. Mr. Harold Watkinson named works in Caernarvonshire, Cornwall, Devon, Norfolk and the North Riding and added that steps were being taken to expedite the Birmingham—South Wales motor road, Tyne tunnel, Forth crossing and Severn bridge, which were part of the general programme, but could have a considerable influence upon the employment situation. He hoped the Staines by-pass and a new bridge over the Thames would be started during the summer, while work would begin on the second half of the Maidstone by-pass and on the Maidenhead by-pass and new Thames bridge in April and May respectively. These works would, when completed, do much to relieve the pressure of holiday traffic. In May or June this year work would start on the viaducts forming the first part of the very important Birmingham—Preston motor road.

Entering for the Wages Stakes

THE lot of the trade union leader cannot be a happy one. Take the case of the N.U.R. While its leaders, with those of the other two railway unions, are concerned with the British Transport Commission in the present examination of railway wages in comparison with those paid in other industries they have been flooded with resolutions from their branches and district councils in various parts of the country. These proclaim fresh discontents and have prompted the submission of yet another claim for "a substantial increase." On behalf of the union it is pointed out that this latest demand does not conflict with the pay review which was designed to compare rates on British Railways with those for comparable jobs elsewhere and was part of the 1958 pay settlement. The new claim is to meet the present situation, particularly in view of reduced earnings as a result of economy measures and the rise in living costs since the last settlement. (Thus are the hard-hit B.T.C.'s economy measures thwarted!) Railway workers had their pay increased by 3 per cent last June on the understanding that an independent committee would examine and report on pay in other industries. There was certainly some delay in setting up this inquiry owing to difficulty in securing agreement on those who should undertake it and on procedure. But presumably it is intended that any revision of rates which may be negotiated on the basis of the findings shall be retrospective to last June. In other words, "Heads I win, tails you lose." Coinciding with the opening of the flat racing season the wages stakes are entered once again. Other early starters will be A.S.L.E.F. and T.S.S.A., with the Confederation of Shipbuilding and Engineering Unions not far behind.

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The Editor is prepared to consider contributions offered for publication in MODERN TRANSPORT, but intending contributors should first study the length and style of articles appearing in the paper and satisfy themselves that the topic with which they propose to deal is relevant to editorial requirements.

We desire to call the attention of our readers to the fact that Russell Court, 3-16 Woburn Place, London, W.C.1, is our sole London address, and that no connection exists between this newspaper and any other publications bearing somewhat similar titles.

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Transport Policy for Europe

A RECENTLY issued report (Brochure 194) by the Transport Users' Commission of the International Chamber of Commerce, which has been approved by the Chamber's council, lays down certain principles which should govern a European transport policy and considers how these should be applied. Coinciding with the coming into being of a European Common Market, with the possible appendage of a free trade area, the document is of exceptional interest; furthermore, it denotes growing acceptance by governments of the case for the users of transport which in recent years it has been the purpose of the I.C.C. to establish. The treaty signed by member States in Rome on March 25, 1957, stipulated that the objects of the Common Market would be pursued within the framework of a common transport policy, and the Chamber's object in issuing the report is to assist in this respect. It points out that the benefits expected to arise from the establishment of a customs union would be nullified if its effect were offset by interference with transport charges—interference, that is to say, in the form of discrimination, undue preference or subsidy, and the levying of frontier taxes. Freedom to the user to choose the form of transport to be used is now said to be universally recognised, and this is put forward as the first of the principles to be followed in a common transport policy. This freedom, it is suggested, also connotes that of using transport for own account when so desired, and the report contains a reminder of a conclusion by the European Conference of Ministers of Transport that "the user should retain complete freedom to choose his form of transport and no restriction should be placed on the freedom of transport on own account."

Two Opposing Theses

THIS statement is contained in an E.C.M.T. report issued in October, 1957, in which the Chamber was "pleased to see clearly expressed the antimony (sic) between two theses in which it has itself long pondered: either (1) professional transport enterprises are operated on a commercial basis, that is to say profitably, which means that tariff obligations are rendered more flexible and that the community as a whole compensates for the obligations of public transport, or (2) this burden of obligations is maintained for reasons other than economic and certain restrictions on transport for own account are proposed in the form of fiscal measures." The Chamber regards the first of these theses as economically sound and is "firmly opposed" to the second which, according to the E.C.M.T. itself, could not bring about more than a moderate reduction of railway deficits. States the Chamber:

> If from the point of view of transport strictly speaking it is possible to hesitate before choosing one of these two theses, this surely cannot be the case from the point of view of the economy as a whole. This moderate reduction in the deficit which professional carriers might hope for as a result of restrictions on transport on own account would be as nothing beside the risks incurred in preventing this highly productive element from playing its full part in the economy, a part which the E.C.M.T. rightly defined as a link in the chain of supply, production and distribution. The risks involved would include that of sending consumer prices up and blocking economic progress the benefits of which, after all, are shared by public carriers.

The statement adds that if the peak traffic which transport on own account is said to leave to public carriers is in fact costly the rates should be fixed accordingly; the user should be persuaded, rather than forced, to abandon transport for own account. In stressing the advantages of fair competition the Chamber says that this can best be promoted by ensuring that charges reflect cost of service and that this should be done as quickly as practicable.

Need for Regulatory Body?

MANY other arguments on transport policy, already ventilated in our columns, are brought out in the report, which also poses the question as to the means of applying a common transport policy. In this matter it counsels caution and leaves for the decision of the I.C.C. Congress which is to be held in Washington next month the proposal, favoured by some countries, to set up in Europe a supervisory body on the lines of the Interstate Commerce Commission of the U.S.A. Established in 1887 and subsequently modified on several occasions, this body since 1940 has been responsible for interpreting, carrying out and supervising Federal transport policy as determined by Congress. The principle underlying policy is to encourage reasonable competition between the various means of transport and carriers using the same means of transport, and also to prevent any excessive, unfair and discriminatory competition in order to achieve the free development of transport under the stimulus of private initiative. The Commission is an administrative tribunal, responsible to Congress, to the Federal Courts which can quash its decisions, and to the President, who appoints its eleven members on the advice of the Senate. Apart from safety, its supervisory powers cover the right to operate services, tariffs and certain investments. It does not intervene in the fixing of tariffs but registers them and so can examine them. Before taking any decision, either following a complaint or on its own initiative, it holds public hearings of which all concerned (carriers and users) are notified in advance and at which they can attend. Organisations representing carriers and users enjoy consultative status with it. If within 20 days no objection has been lodged, its decision becomes binding but there are various means of appeal.

Some Shortcomings and a Warning

THE report points out, however, that the Interstate Commerce Commission is not free from criticism; opinion in the United States suggests that its too strict regulation of their tariffs is placing the railroads in an unprecedently difficult position. "No one pretends," states the Guaranty Trust Company, "that freedom to compete in rate-making would solve all the railroads' problems. It would, however, give them a better chance to ultilise their inherent competitive advantages by means that are and always have been approved and encouraged in all free economies, for the soundest of reasons and with the most brilliant results. At the same time it would permit the public to enjoy more of the benefits that a great transportation system is capable of providing." This statement is compared with one by the secretary of the Economic Commission for Europe that "in countries with an unplanned economy competition is the mainspring of the economy; it can be organised but it should not be abolished." Then there is the question of publication of rates, on which point the report remarks that the requirement that tariffs should be filed with a body like the Interstate Commerce Commission and made available to the public might well prevent flexibility in rate-making. From all of which it is small wonder that Mr. A. G. Marsden, writing as honorary chairman of the Transport Users' Commission, should preface the brochure with a warning. He urges that in view of the circumstances narrated Europe should "avoid the pitfall of adopting a detailed and arbitrary regulatory system which many feel is itself now in need of reassessment and revision in the face of current industrial and transportation relationships." There is much of interest in this report. Gratifyingly, one gains the impression that the proposed European transport policy is being modelled on principles already adopted in this country and implemented with benefit to all concerned.

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Forthcoming Events

March 21.—Stephenson Locomotive Society (North Eastern). Paper by Mr. H. A. Vallance, "West Highland Railway in North British Days." At Griffin Hotel, Boar Lane, Leeds, 1. 6.30 p.m.

Stephenson Locomotive Society (North Western). Paper by Dr. J. R. Hollick, "The Leek and Manifold Railway." At Conference Room, Central Station, Liverpool. 7.30 p.m.

Railway and Canal Historical Society (North West). Paper by Mr. W. J. Skillern, "The Poynton Colliery Railway." At Oddfellows Institute, Stockport.

Light Railway Transport League. Paper by Mr. V. E. Burrows, "The Tramways of Vienna." At 153 Drummond Street, N.W.1. 6.30 p.m.

March 24.—Institute of Transport (Scottish). Annual dinner. At Glasgow.

Institute of Transport (Humberside). Informal dinner and film show. At George Hotel, Whitefriargate, Hull. 7 p.m.

Institute of Transport (Leeds G. and S.). Paper by Mr. G. W. Battensby, "Looking Back." At Leeds City Transport Department, 1 Swinegate, Leeds, 1. 7 p.m.

Railway Correspondence and Travel Society (East Midlands). Paper by Mr. R. Dyson, "The Cheshire Lines Railway." At N.C.S. Guild Room, Toll Street, Nottingham. 7.30 p.m.

March 25.—Railway Students' Association. Paper by Mr. S. B. Taylor, "R.S.A.—The First Fifty Years." At London School of Economics, Houghton Street, W.C.2. 6.15 p.m.

B.R. (Southern Region) Lecture and Debating Society. Annual general meeting and reading of prize essay. At Chapter House, St. Thomas' Street, S.E.1. 5.45 p.m.

AN IMPORTANT INTERNATIONAL WATERWAY

The St. Lawrence Seaway Nears Completion

RESULTS OF MORE THAN FIFTY YEARS' WORK

THE St. Lawrence Seaway is essentially a water highway from the sea to the heart of North America. Since the first half of the 16th century when the explorer Jacques Cartier was turned back by the rushing waters of the Lachine Rapids from his dream of finding the Northwest Passage and the route to the East, men have devoted their thoughts and their works to the building of a deep waterway from the Atlantic Ocean into the great inland lakes. Since the completion of the Welland Ship Canal in 1932 the obstacle to the realisation of this aim has been the 14-ft. deep bottleneck between Montreal and Prescott which had to be removed and the provision of deeper channels between Lake Ontario and Lake Erie to allow 27-ft. navigation throughout the St. Lawrence.

To provide this navigational facility and to operate it the St. Lawrence Seaway Authority, a Crown Corporation, was established by Act of the Canadian Parliament in December, 1951. The Act was proclaimed and the appointment of its members made public on July 1, 1954.

On June 26 Her Majesty the Queen accompanied by H.R.H. Prince Philip, Duke of Edinburgh, will take part in the ceremonial opening of the St. Lawrence Seaway, together with President Eisenhower, whose presence will symbolise the important share of the United States in this great project. Use of the seaway will begin next month with the spring reopening of the St. Lawrence to navigation. With the ice on the Great Lakes breaking up and the finishing touches being put to the major engineering works involved, it is appropriate in this issue of "Modern Transport," which is devoted especially to overseas transport and trade, to consider the historical background of the seaway project and the work which it has involved.

Early Canals

The first recorded improvement in the long history of navigation on the St. Lawrence waterway dates back to 1700, when a 1½-ft. canal was constructed at the Little River St. Pierre near Lachine. In 1780 and 1804 short side canals 2 or 3 ft. deep were constructed at the edge of the rapids. Using them were, among other craft, the huge freight-carrying "canots de maître" of the fur-trading companies as they plied between their base at Montreal and the remote posts of the west.

It was only in 1821 that the first Lachine Canal proper was undertaken. From a 5-ft. depth this canal was deepened to 9 ft. between 1843 and 1848. A second and last enlargement, between 1870 and 1883, provided a 14-ft. depth throughout. This Lachine Canal, now 8¾ miles long, has a total lift of 50 ft. and gives access from the port of Montreal to Lake St. Louis, that widening in the St. Lawrence River which is increased by the confluence with the Ottawa River from the north and west.

Soulanges and Beauharnois Canals

The Soulanges section of the seaway extends from deep water at the head of Lake St. Louis to deep water at the foot of Lake St. Francis, another widening in the course of the St. Lawrence. Between 1779 and 1783, the Royal Engineers constructed four side canals with locks 6 ft. wide, giving 2½-ft. depth to overcome the Cascades, Split Rock, Cedars and Coteau Rapids, in ascending order.

The Beauharnois Canal, on the southerly shore, built between 1842 and 1845, replaced these earlier canals and provided 9-ft. navigation. It, in turn, was replaced by the Soulanges Canal on the opposite side of the river, begun in 1892 and completed in 1899. It has five locks, a total lift of 84 ft. and provides 14-ft. navigation. The power canal at Beauharnois for hydro-electric development, completed in 1932, was purposely built to give a 27-ft. channel and thus, when the seaway scheme was implemented, was awaiting only necessary locks and other navigation essentials to provide the deep waterway through this section of the river.

International Rapids Section

The International Rapids section extends from St. Regis at the head of Lake St. Francis to Chimney Point, east of Prestcott. It has a total difference of water level of some 92 ft. and this is overcome by a series of canals. The first of these, proceeding up-river, is at Cornwall, where a 9-ft. canal was built between 1834 and 1842. In turn this canal was enlarged to 14-ft. depth between 1876 and 1900. Next in order is the Farran's Point Canal, first built between 1844 and 1847 and enlarged to 14 ft. depth between 1897 and 1901.

The Rapide Plat Canal at Morrisburg, constructed at the same time as the canal at Farran's Point, was enlarged to provide 14-ft. draught between 1884 and 1904, and the last in the series of canals in this section is the Galop Canal at Iroquois. Construction of this canal for 9-ft. navigation commenced in 1844 and was completed in 1848. This canal was later enlarged to 14-ft. depth and completed in 1908.

Welland Ship Canal

The obstacle to navigation between Lake Ontario and Lake Erie is presented by the Niagara River, its rapids and Niagara Falls. Between the lakes there is a difference in level of 326 ft. This is overcome by the Welland Ship Canal, which crosses the Niagara peninsula 10 miles west of Niagara Falls. It is some 27 miles long. The first canal here was built by a private company between 1824 and 1833 and had a depth of 7½ ft. This canal was later taken over by the Government of Upper Canada and enlarged to 9 ft. between 1842 and 1850. Its completion coincided with the completion of the St. Lawrence Canals in 1848 and permitted vessels 140 ft. long, of 26-ft. beam and 9-ft. draught to ascend for the first time from Montreal to Lake Erie.

Construction of the third Welland Canal was begun about 1873 and completed for 14-ft. navigation in 1887. It required no fewer than 26 locks to accomplish the lift from Lake Ontario to Lake Erie. In 1913 work was begun on the Welland Ship Canal, but construction was suspended in the autumn of 1916 due to the 1914-18 war and was resumed after the cessation of hostilities and completed in 1932. The lift from lake to lake is the same as by the old canal but is accomplished with only eight locks as against 26 in the 14-ft. canal. Seven of these eight locks are 859 ft. long and one is 1,380 ft. in length. All are 80 ft. wide with 30-ft. depth over the lock sills. The available depth has been 25 ft., although about 17 miles of the canal already had a draught of 27 ft. and dredging will bring the entire canal to that depth.

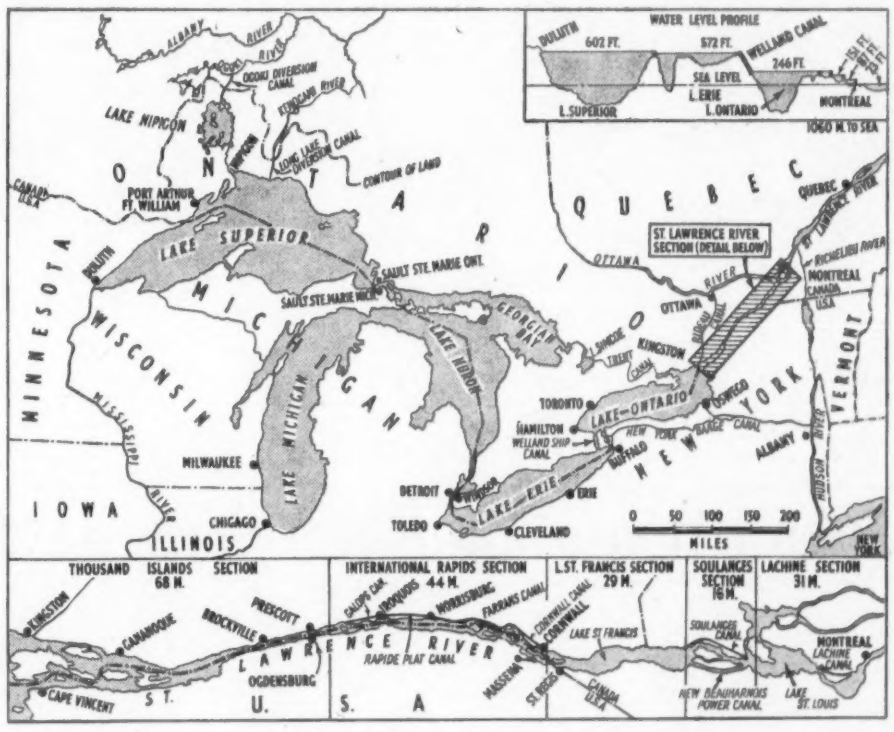
International Negotiations

Although the subject had been considered for over a century, the first concerted action of the Governments of Canada and the United States in connection with a deep waterway from the Great Lakes to the sea may be said to date at least as far back as 1905. Then a joint International Waterways Commission was created to deal with all matters relating to international waters between Canada and the United States. Negotiations were begun and continued over the years with the end in view of finally establishing a deep waterway throughout the whole St. Lawrence Basin.

No subject has been more thoroughly discussed, none more carefully studied. All of these studies culminated in first, the Treaty of Washington signed between Canada and the United States in 1932 which was *not* approved by the United States Senate. Next followed the Great Lakes—St. Lawrence Basin Agreement of 1941 concerning a deep waterway from Montreal to the head of the Great Lakes. This agreement failed to receive the approval of the United States Congress.

Canadian Initiative

After 10 years without progress because of the failure to get approval of the agreement and because further development of hydro-electric power in Southern Ontario became of considerable importance to Canada (and also to the United States) a new approach was adopted by Canada. The first step was the conclusion of an agreement in December, 1951, between the Governments of Canada and Ontario. This agreement provided for



Plans of the Great Lakes and the St. Lawrence showing the relationship of the seaway to the hinterland and also the water-level profile

the construction of the seaway by the Federal Government of Canada and for the development of power in the International Rapids section by Ontario and an entity to be designated by the United States.

The next step was to secure the approval of the Canadian Parliament for this agreement and legislation to provide for the construction of the seaway. Parliament approved the agreement and enacted legislation for the establishment of the St. Lawrence Seaway Authority in December, 1951. The third step resulted, in June, 1952, in agreement between Canada and the United States whereby both countries would join in asking the International Joint Commission (which has jurisdiction over these boundary waters of the International Rapids section) to approve the joint development of power in that section by the Hydro Electric Power Commission of Ontario and a power entity to be named by the United States. It was understood that Canada would build all the navigation facilities on the Canadian side between Montreal and Lake Erie to provide for 27-ft. navigation. The International Joint Commission approved this power project on October 29, 1952.

United States Change of Heart

In June, 1953, the United States Federal Power Commission issued an order granting a 50-year licence to the Power Authority of the State of New York for the development of the United States' half of the power project in the International Rapids section in conjunction with Ontario Hydro. This did not constitute the final authority to construct the joint power project because the Federal Power Commission's order was challenged in the United States Courts by opponents of the project. The United States Supreme Court, in June, 1954, upheld the action of the Federal Power Commission in granting a licence to the Power Authority of the State of New York. This decision enabled the power entities to undertake construction of their project. By the construction of the power project, a lake would be created in the International section, which would allow the construction of the seaway.

Meanwhile, however, the United States Congress enacted the Wiley-Dondero Act authorising and directing the Saint Lawrence Seaway Development Corporation to construct on United States territory all the navigation facilities in the International Rapids section.

The situation thereby created called for discussions between Canadian and United States representatives to determine how the seaway would be built. In the final analysis, the United States decided to build a canal and two locks opposite Barnhart Island in the International Rapids section and to do dredging in the Thousand Islands section. Canada decided to build a lock and canal near Iroquois in the International Rapids section in addition to completing all the necessary navigation facilities in Canadian territory between the port of Montreal and Lake Erie. The estimated costs of the United States works are about $135 million while the estimated costs of the Canadian works are about $300 million. Work was begun on the power project in August, 1954, and thereafter it was possible to start work on the seaway. The preliminary works on the Canadian side were undertaken in September, 1954.

Recent Facilities for Navigation

During the last navigational season the following facilities were available to shipping: From the Atlantic Ocean to Montreal and in that port and at its wharves there was maintained a depth of water of 35 ft. A deep-water ship channel to that depth is dredged and maintained from a point 30 miles below Quebec City to Montreal.

From Montreal, via the Lachine Canal, Lake St. Louis, the Soulanges Canal, Lake St. Francis, the Cornwall Canal, the Farran's Point Canal, the Rapide Plat or Morrisburg Canal and the Galop Canal to a point four miles below Prescott, Ontario, the governing depth was 14 ft. In July, 1958, flooding of the area between Cornwall and Iroquois terminated use of Farran's Point, Morrisburg and Galop Canals and a portion of the Cornwall Canal and navigation at canal draught was handled by the Iroquois, Snell and Eisenhower locks and new channels.

From just below Prestcott, Ontario, through the Thousand Islands section of the St. Lawrence River to deep water in Lake Ontario, there were maintained channels which gave a depth of water of 25 ft., and from Lake Ontario to Lake Erie, via the 27-mile Welland Ship Canal, the available depth of water was 25 ft. From Lake Erie to the Head of the Lakes, there were maintained channels which gave a depth of water of 25 ft. for downbound vessels and 21 ft. for upbound vessels. As already indicated in the steps which the St. Lawrence River system takes from the level of Lake Superior to the Atlantic, there is a drop of 602 ft. The river drops 326 ft. through the Welland Ship Canal and 225 ft. from the level of Lake Ontario to Montreal.

Works Involved in the Seaway

The drop in the level of water in the Lachine section is 50 ft. in the 31 miles and most of it is in the Lachine Rapids, where it is possible to develop 1,200,000 h.p. of electrical energy. The St. Lawrence Seaway Authority has built a 20-mile canal with considerable channel enlargement extending from deep water in Montreal Harbour to Lake St. Louis above Caughnawaga. The canal entrance is a short distance east of Jacques Cartier Bridge, and the canal follows the south shore, partly in the Laprairie Basin and partly inland. There are two locks, one at Victoria Bridge and one at Cote Ste. Catherine, opposite the Lachine Rapids. These locks have the same dimensions as those already mentioned for the Welland Ship Canal. (The length available for ships is generally limited to 715 ft., the width 80 ft., depth over sills 30 ft.)

In 1947, a board of engineers was established by the Government of Canada to consider whether the scheme for the improvement of the Lachine section as recommended by the joint board of engineers in 1926 provided to the best advantage for such improvement and, if not, what alternative scheme it would recommend. The board made public its report, which was widely circulated in 1948, and recommended to the Government two schemes for power and navigation and one scheme for navigation alone. The plan which the St. Lawrence Seaway Authority has adopted for the Lachine section is the same in all respects as the one contained in the report of 1948 save that the canal is on the south side. The canal—from Lachine Rapids to Montreal Harbour—is thus on the land side of the embankment in Laprairie Basin as well as from Victoria Bridge to the harbour.

The principal reason for placing the canal on the south side around Laprairie Basin was that it would permit extension of Montreal Harbour to this area and create an important industrial area adjacent to Montreal. It also made it easier to cope with both the present and future highway communications between Montreal and the south shore under the proposed plan of development. It also avoided bringing the large Upper Lakers through St. Mary's current and the congested area of the Montreal Harbour, and railway traffic conditions at Victoria Bridge were materially improved as compared with a railway-canal crossing at the Montreal end of that bridge.

Modifications to Bridges

Regulations provide that bridges across the seaway shall have a minimum clearance of 120 ft. Since the canal skirts the south shore at Longueuil and the southerly spans of the Jacques Cartier Bridge did not provide such clearance, it was necessary to elevate the bridge, and at the same time an additional traffic lane was added to its downstream side.

The raising of Victoria Bridge, however, was more complicated. This was a low-level bridge and to co-ordinate highway facilities with the rights of navigation presented a difficult problem—the St. Lambert Lock was built near its southerly end. The bridge is the property of the Canadian National Railways and its engineers and those of the St. Lawrence Seaway Authority agreed upon a plan to provide maintenance of the normal flow of traffic. A lift span was to be installed over the proposed canal and an added vehicular traffic lane was made available with the removal of tracks of the Montreal and Southern Counties Railway.

Uninterrupted Traffic Flow

Use of the proposed canal embankment for a short distance would permit uninterrupted vehicular traffic across the seaway, and the plan would be co-ordinated with those for improvement of highway facilities across Victoria Bridge. A lift span at the upper end of the St. Lambert Lock would be lowered into place when the downstream span is lifted. The southern end of the Honore Mercier Bridge was elevated and a satisfactory approach to the bridge from the Caughnawaga side constructed. This was done in co-operation with provincial highway authorities. A movable span was installed in the Canadian Pacific Railway bridge at Caughnawaga.

Turning basins have been constructed to allow ships, both deep-sea and lake carriers, to manoeuvre more freely in and out of the Lachine section and to provide 27-ft. navigation to the head of Lake St. Louis the channel is being dredged through the lake from the end of the channel and dyke construction above Caughnawaga to the beginning of the Soulanges section.

Soulanges Section

This section extends from the head of Lake St. Louis to the foot of Lake St. Francis and is 16 miles long. The total fall in this section is some 82 ft. represented by the Cascades, Split Rock, Cedars and Coteau rapids. To pass these, the Soulanges Canal offered 14-ft. navigation, but the new seaway makes use of the Beauharnois Canal. Power installations at the eastern end of that canal had to be by-passed, and two locks were installed to lift vessels from Lake St. Louis to the level of the Beauharnois Canal.

The part of the canal which will be used for navigation was crossed by two combined highway and railway bridges consisting of fixed spans. The parts of the substructures of these two bridges adjacent to the navigation portion of the canal were built to provide for the future installation of vertical lift bridges which provide a clear horizontal width of 200 ft. and a vertical clearance of 120 ft. Modifications had to be made to one other bridge to provide for traffic over the canal, and a four-lane highway tunnel was constructed to carry traffic beneath the channel from one side to the other.

Lake St. Francis and International Rapids

The Lake St. Francis section, which lies wholly in Canada, is 29 miles long. It is a widening in the St. Lawrence River, has an area of about 90 square miles and has a total drop from one end to the other of about 1 ft. To provide 27-ft. navigation in this section, dredging of shoal areas over the proposed seaway course was all that was required. This represents a marked contrast with the International Rapids section, extending from the western end of Lake St. Francis to Chimney Point, four miles east of Prescott, Ontario. This section is 47 miles long with a total difference of water level of 92 ft. Just west of Cornwall are the power houses capable of developing 2,200,000 h.p. built by the Hydro-Electric Power Commission of Ontario and the Power Authority of the State of New York. The main power features are: A dam below the Long Sault Rapids from the American mainland to the head of Barnhart Island, and two power houses (divided only by the international boundary line) from the foot of Barnhart Island to the Canadian mainland just above Cornwall, Ontario. There is an upper control dam in the vicinity of Iroquois Point and dykes, where necessary, to retain the pool level and reduce flooding. The scheme also involved relocation of highways and railways, and extensive channel enlargements.

This created an artificial Seaway Lake, some 30 miles in length and from 1½ to 4 miles wide. The essential navigation works consist of two canals, one on Canadian territory at Iroquois, with one lock to by-pass the control dam, the other on American territory opposite Cornwall with two locks to by-pass the main dam and powerhouses. Thus, vessels proceeding upstream from Lake St. Francis will enter the Snell Lock at Grasse River on the American side, transit the Long Sault Canal and enter the power pool at the Eisenhower Lock. It will proceed by the indicated channel to the Iroquois Lock on the Canadian side and by that lock and its canal be lifted to the water level of the Thousand Islands section and proceed by dredged channels into Lake Ontario.

LORRY—BUS—COACH

Tribunal Again on Weak Evidence

IN what was the first appeal to come before it concerning through road freight service from this country to Continental destinations the Transport Tribunal has reversed a decision of the Metropolitan Licensing Authority and granted two refrigerated vehicles (four were sought) to Mr. P. Rhodes, of London, E.1. The export of meat to Italy, which figured largely at the public inquiry, was a mushroom traffic, says the Tribunal, springing up suddenly in 1957. The export of all kinds of meat, fresh, chilled or frozen, rose from 172 tons in 1956 to 2,110 tons in that year. The demand for Interfrigo refrigerated railway wagons has very greatly increased; the 70 wagons available last year are being increased to 110 by the end of this year.

Making "the best guess we can in the light of the whole of the evidence put before us," says the Tribunal, the position would be met by one vehicle a week for the use of the single customer named at the inquiry. As the round journey to and from the Swiss-Italian frontier will occupy a week, according to the appellant, it is necessary for him to have two vehicles. The judgment refers to "the failure on the part of such experienced persons as the licensing authority and representatives of all parties" to notice a serious discrepancy in a certified document showing earnings of two vehicles between February or March, 1957, and February, 1958. Neither vehicle, the Tribunal points out, was added to the appellant's A-licence until September 20, 1957. It says this is a particularly striking example of the inconvenience of the practice which permits documents of importance to be put in evidence at the last moment.

Llandudno Company Loses Appeal

AN appeal by the Llandudno and Colwyn Bay Electric Railway, Limited (now solely a bus undertaking) against decisions of the North Western area Traffic Commissioners refusing to confirm its proposal to vary road service licences of Crosville Motor Services, Limited, for stage services between Llandudno and Rhyl, Penmaen Head and Denbigh, so as to reduce the winter frequencies of these services, has failed. The Minister of Transport agrees with his inspector's conclusion that the appellant failed to establish that the proposed reduction in frequency would be in the public interest, having regard to the needs of the area as a whole.

Ribble Reserves Have Dwindled

IN the past five years Ribble Motor Services, Limited, had gone into reserves to the tune of £700,000 and now had only £300,000 in hand, which was not enough to cover the cost of the annual intake of vehicles, Mr. H. Bottomley, general manager, told a joint sitting of the North Western, Northern and Yorkshire area Traffic Commissioners at Morecambe last week. The Commissioners reserved decision on the company's application—the eighth since the war—for fare increases designed to yield an extra £175,000 in a full year. The application was also made on behalf of Ribble's associated operators. Ordinary fares up to 5d. inclusive will not be raised; above that some will be increased by one penny. Other classes of fate would be selectively raised by 1d. or 2d.

For the company, Mr. F. D. Walker said that a saving of £36,000 was estimated on a full year with the introduction of one-man-operated bus services, but there had been increases in the cost of tyres, fuel and lubricants accounting for an extra £16,000. Mr. Bottomley said that by using bigger buses Ribble would eventually reduce its fleet of double-deck buses, which now numbered 644. The reduction might be as much as 10 per cent, bringing the number down to 580. "We have not been able to build up on general reserves to meet the higher cost of new vehicles," he added. "We have had five bad years during which time we have not put anything aside for the cost of new vehicles."

A Chesterfield Corporation Leyland Titan 59-seater passing the famous crooked spire: right, A.E.C. Regent V 70-seater of Yorkshire Woollen District Transport leaving Dewsbury bus station. Both buses have M.C.W. bodywork

Bus Operator and Fuel Charges

FINES totalling £5,120 were imposed on George Gray, a bus and coach proprietor, of Clackmannan, at Alloa Sheriff Court on March 11 when he was found guilty of defrauding the Customs and Excise of more than £1,400 in heavy oil duty and of two other charges relating to the keeping of heavy oil records and documents. It was stated that Gray, a member of Clackmannan County Council would sell his business to pay the fine. The alternative was 12 months' imprisonment. Gray operates under the fleet name Scott's Grays Coaches and is understood to have some 10 vehicles. He is stated to have been found not guilty of similar offences in March, 1955, and February, 1956.

A.A. Motor Services Denial

A NOTICE ordering employees to "categorically deny" any rumours of takeover of their firm was posted in the three depots from which A.A. Motor Services, Limited, of Ayr, operates. The rumour was that the system was going to be absorbed by the Western S.M.T. Co., Limited. The chairman, Mr. William Dodds, said: "I don't know how this began but there is definitely no truth in it." A.A. Motor Services, Limited, is the stage operator using vehicles of three associates, Dodds (Coaches), Limited, Troon; Tumilty, of Gailes, and Young, of Ayr. A company spokesman in Ayr said that no approaches had been made by either side.

Marylebone Meters and Goods Vehicles

GOODS vehicles will be limited to certain specified parking places if the Marylebone parking meter scheme just approved by a Ministry of Transport Order is not modified. This question is, however, under review by the St. Marylebone Borough Council. The scheme, which envisages 476 meters in an area bounded by Oxford Street, Edgware Road, George Street and Marylebone Lane, adjoins the existing north-west Mayfair zone on the south side of Oxford Street, and is likely to come into operation in June. Parking will be prohibited other than in areas designated as parking places, but commercial vehicles will be free to load and unload, except at certain specified street junctions.

Consultants at Portsmouth

CONTROVERSY has been carried a stage further by the appointment by the City Council of the firm of Harold Whitehead and Partners, Limited, to conduct an inquiry into the future of the trolleybuses. In a report after a preliminary survey, the consultants say that an objective assessment of the comparative economics of operating the two types of vehicles is now urgently needed. They proposed to do this, taking account of the vehicles' respective operating and physical characteristics, pattern of passenger transport demand of the area, the future trend of costs of oil compared with electricity, and of vehicles and ancillary equipment. Other questions such as public health, use of imported fuel, and amenity would also have to be considered.

The form in which the published accounts are presented has, the consultants believe, "played a considerable part in obscuring the relative merits of trolleybuses and buses in the public mind and in promoting criticism. We are confident that the department's accounting section has all the information available, but its presentation in the approved form hinders a balanced factual appraisal of the situation." They will interview members of the Passenger Transport Committee, and other interested persons, such as representatives of the ratepayers and the local Press, analysing traffic statistics, estimating future trends of traffic and costs, and obtaining data from other transport undertakings and other sources.

In examining the joint agreement with Southdown Motor Services, Limited, the firm proposes to seek answers to the following questions, before making recommendations for modification of the agreement:

Does the agreement in any way materially hinder the development or economical operation of the Corporation's transport undertaking?

Has the operation of the agreement since its inception given the Corporation a fair share of the revenue earned jointly?

Do the long-term prospects for passenger transport in the area covered by the agreement suggest that, if the agreement is continued in its present form, there will be any change in the balance of advantage between the Corporation and Southdown?

The fee for the report of the consultants will be £2,400 plus £2,400 for establishing a cost control system.

Goods Vehicle Population

AT the end of September, 1958, the total number of motor vehicles on the roads of Great Britain (excluding Service and Government vehicles) was 7,903,638, compared with 7,427,101 twelve months earlier. Goods vehicles increased in numbers from 1,215,480 to 1,268,498; there were more than 50 per cent more oil-engined vehicles weighing not more than two tons unladen compared with the corresponding date of 1957—16,103 against 10,624. Battery-electric vehicles also increased slightly in the up to two tons unladen range. Hackney vehicles with more than eight seats were almost stationary—75,173 against 75,117, excluding trolleybuses. The latter advanced by two to 3,443.

Bus and Coach Developments

John Irvine, Friester, South Nesting, Shetland, proposes withdrawal of his Nesting—Lerwick service.

Thames Valley Traction Co., Limited, proposes to extend certain Mortimer Common journeys on its Reading—Tadley service (9) to Baughurst via Falcon Inn.

Western National Omnibus Co., Limited, proposes local services at Tavistock to Whitchurch via the Cemetery (84) and Crelake (84A).

J. Abbott and Sons (Blackpool), Limited, seeks the excursions and tours from Fleetwood and Cleveleys of Lansdowne Motors, Limited.

Premier Travel, Limited, proposes a local service in Saffron Walden on Tuesdays, Fridays and Saturdays. It would follow a circular route.

Among entries for the British Coach Rally at Brighton on April 18 and 19 is a 40-seat Kassbohrer Setra S11 of Deutsche Touring G.m.b.H., Frankfurt.

Eastern Counties Omnibus Co., Limited, applies for various licence modifications to incorporate the services of Longland's (Crowland), Limited. This operator has a fleet of three double-deck and five single-deck vehicles.

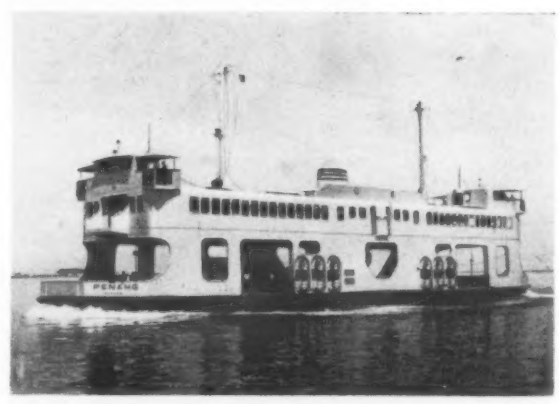
From March 18 Green Line coaches on Service 722 (London—Corbets Tey) commenced carrying local passengers between Corbets Tey and Upminster (Bell) at a 3d. fare. This is intended to relieve pressure on Service 370.

Burnley, Colne and Nelson Joint Transport Committee applies for services between Blackburn and Nelson, Padiham and Nelson, Burnley and Barnoldswick, Burnley and Hapton, and Burnley and Higham to be operated jointly with Ribble Motor Services, Limited.

British Aluminium increases payload

A Vickers Viscount of Trans-Australian Airlines

Today aluminium is widely used for every form of transport, by land, sea and air. Aluminium construction cuts deadweight and increases payload, while maintenance and running costs are impressively low. Shown here are some of the thousands of vehicles at work in the world with British Aluminium.



The ferry vessel Penang by Singapore Harbour Board for the Penang Port Commission

A Colombo trolley bus by East Lancashire Coachbuilders Ltd.

A 12-ton goods wagon for the Indian National Railways system

The BRITISH ALUMINIUM Co Ltd
NORFOLK HOUSE ST JAMES'S SQUARE LONDON SW1

AP328

CO-OPERATION BETWEEN EUROPEAN RAILWAYS

Work of the O.R.E.

*By Dr. F. Q. DEN HOLLANDER, lately President, Netherlands Railways**

SINCE the 1939-45 war the various European railways have made great strides forward and have been a vital instrument in furthering European integration, and we can feel justly proud of the achievement and progress made in the railway sphere. Extensive modernisation programmes necessitating vast sums of money are now in full swing in many European countries, and these must be completed as rapidly and economically as possible if we are to reap the full benefits. We should therefore pool our resources and exchange technical data and ideas. We should not forget that railway transport is but one form of transport existing alongside that of transport by road, water, air, and even by pipe, wire and cable.

About 10 years or so ago several railway administrations decided to establish a close co-operation in the research and experimental work of all railway equipment so as to achieve rapid modernisation and thus be able to regain their position among the other transport bodies and recuperate their losses. For this purpose an Office for Research and Experiments, now better known as O.R.E., was created by the administrations within the International Union of Railways.

Principal Objects

Its principal objectives are to co-ordinate the efforts and resources of its member administrations, to pool the results of research and tests carried out by the different member railway administrations, and to distribute the necessary technical documentation among all its members. O.R.E. carries out certain investigations on joint account and studies ways and means for reducing the operating costs and construction costs of all railway equipment and, in addition, examines the possibilities of distributing the manufacturing work between the industries of the various countries, with the aim of rationalising the manufacture of railway supplies which could be shared on an international (European) scale.

Under this set-up collective utilisation is made of men and resources, duplication and overlapping of work and studies is avoided, and O.R.E. has a very large field of experiment at its disposal covering thousands of kilometres of track presenting every feature of special interest. Thus the results can be used to obtain general solutions wider than any applicable within one particular administration.

The appeal made to the railway administrations produced very satisfactory results, and today there are 29 member administrations of O.R.E., namely, the French, British, West German, Polish, Italian, Swedish, Yugoslavian, Spanish, Hungarian, Austrian, Belgian, Finnish, Norwegian, Netherlands, Portuguese, Swiss, Danish, Canadian, Indian, Iranian State, Irish Republic, Luxembourg, Damas Hama, Lower Congo-Katanga, Colonial Transport, and Great African Lake railways, and also the International Sleeping Car and German Sleeping Car companies, and Interfrigo. The apportionment of subscription fees for membership is worked out according to the operated mileage of track in each administration and a special scale is applied in the case of distant administrations.

Sound Financial Basis

The most important task entrusted to O.R.E. by its founders was to provide the means for placing all the member administrations on a sound and healthy footing, thus enabling them to carry out their functions more efficiently and economically. This implies that all costs, including the depreciation costs arising from all replacement of railway equipment, must be covered by the revenue earned by the railways. In other words, higher income—lower costs.

A higher income will depend on greater passenger and freight traffic receipts, and two factors play an important part in this respect, namely, the timetable and the rates and fares, both of which are closely linked with the comfort afforded to the passenger and the facilities and service afforded to the client for the transport of his goods; especially door-to-door delivery. Lower costs will be obtained by employing less staff, reducing the amount of maintenance required, using less energy and thus, as a consequence, entail less depreciation as a result of reduced investments.

O.R.E. is at present studying all these factors, and 29 specialist committees and five groups of rapporteurs, making a total of 212 specialists from 18 different lands—quite a number of them specialists from British Railways—are working on all these problems, and regularly submit their findings to the control committee of O.R.E. who in turn report these to the board of management of the U.I.C. Gradually this advice is put into practice, giving the railways a new appearance on the track, in the signalling and in the rolling stock.

Smooth Riding

In transport comfort is a particularly important factor, and the aims are fourfold, namely, smooth riding at high speeds, good seating, good heating and good lighting. A careful and detailed study has been made of the problem of smooth riding. Two trains, each composed of carriages loaned by the administrations participating in these tests, have run a distance of over 100,000 miles in continuous service on two tracks, one in France and one in Germany. The riding quality of these trains has been observed by the specialists and the wear and tear of the wheel tyres and of the bogies carefully and accurately measured.

The bogie is a vehicle in itself and possesses a behaviour of its own on the track. Together with a second bogie its construction has been adapted and redesigned to carry the body of the modern carriage or wagon. The stability of the entire assembly of the two bogies plus the carriage or wagon body is still under study, and when completed should lead to obtaining a good bogie. As yet mathematicians and experimentors are not so far advanced that, on reliable and concrete bases, the principle of bogie design can be laid down.

Heating means conditioning of the air in the interior of the carriage. This problem is considered one of importance and urgency, but, heating requires a large amount of energy and involves costly equipment. Thanks to the Austrian Government, however, O.R.E. now has the opportunity to build a test installation at Vienna, where, in the future, it will be possible to carry out research and experiments at both lower (−15 deg. C.) and higher (+25 deg. C.) temperatures in static and dynamic chambers as well as tests in a wind tunnel at speeds ranging from 0 to 120 km.p.h. Together with the experience gained over the last three years on the track, where many facts and figures have been gathered, this set-up is most promising for improving passenger comfort and for reducing costs.

Room for Improvement

Research into the organisation and movement of passengers and freight will certainly point towards improved running schedules, modern and up-to-date structures such as stations, sheds and depots, and indeed, towards a general improvement in all railway equipment, especially in rolling stock. The less strain and less changing of trains that is necessary the easier and more attractive travel becomes for the passenger. In this respect there is still much to be done, and national feelings and traditional obligations hamper a general survey being made.

The same is necessary for freight. When a trader sends his products abroad by lorry, ship or plane, he entrusts these to one transporter, but when he gives his products to the railways for transport they are handled by several, and hence it is essential that, during their transit, they are always handled in an identical fashion. Here too, much has still to be done in the matter of rationalisation and standardisation.

As to costs, the investment value is of cardinal importance, and the higher the purchasing costs the higher the rentability and depreciation costs, and the less that can be done with a given amount of money. The principal task is therefore to reduce the costs of all equipment by as much as possible, and this will be achieved by attaining maximum standardisation, establishing the closest and best possible co-operation with the industry, and buying on as large a scale as circumstances permit. Here O.R.E. has achieved a better overall picture of the situation through all those in a position of management, and gradually fresh ideas are being brought to light and to fruition.

Track Economics

It has taken the railway track and its component parts, namely, ballast—sleepers—fastenings—rails, as its first study. Actually the rail is the main subject. Given the maximum permissible axle load and speed, the rail possessing the best profile and the most economic weight can be chosen. Up to present a weight of 46 kg. per metre has been customary, but, as heavier, more frequent and faster traffic is now having to be supported by the rail, weights of 54 kg. and 60 kg. are also under consideration, which implies an increase in weight per metre of rail of respectively 17 and 30 per cent.

A second important item is the rail fastening. The type of fastening is dependent on whether concrete or wooden sleepers are being used, as is also its design and that of its component parts. The question is still more important when the long-welded rail is concerned. To a large extent track circuiting is done by the rails, and, to accomplish this, the rails must be insulated. The use of rail fastenings on concrete sleepers creates many difficulties, but specialists are seeking the solution and will find it. It might therefore be expected that all this work will finally result in a far more perfect track and, even if not without fishplates, one with a rail of economic weight, well insulated, strongly and elastically attached to the sleeper, and very rigid against stress resulting from temperature variations.

Motive Power

Movement of the rolling stock along the lines takes energy, which is scarce and expensive, and thus the energy consumption must be reduced to a minimum. Steam in an engine has a very poor thermal efficiency and is no longer acceptable for present day needs, hence it must be replaced as speedily as possible. There are two solutions. Energy produced and supplied from a central power station, resulting in much better efficiency, or, replacement of the steam locomotive by the diesel locomotive.

For the first, namely electrification, the initial costs are very high, but once established, results in cheaper operating costs. The second solution, dieselisation, is far less expensive as an investment, but more costly in maintenance. The formula must therefore be: lines with high traffic density, electrification, and the others, dieselisation.

Savings with Modern Traction

The moment modern railway traction is fully in service its results are twofold, firstly, no more steam locomotives, and secondly, a saving of money—which is of paramount importance for the life of the railways. In such a case there would be a very great reduction in fuel consumption and also in the vast areas of land required at present for shed yards, coal stages, water supply plants, turntables and numerous lines with points that could then be dispensed with. Moreover, less staff are needed for the manning of modern diesel and electric locomotives, and both are much simpler to operate than the steam locomotive.

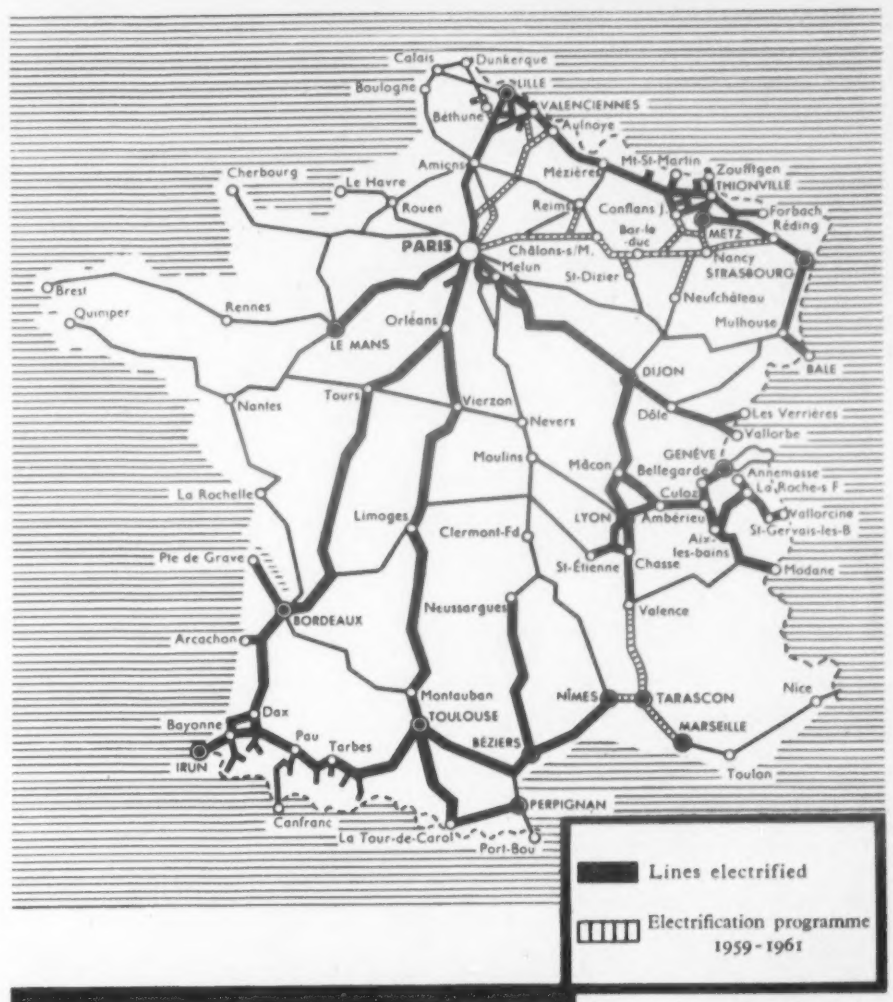
Absence of smoke, ash, dirt and grit enables all railway equipment including property, structures and rolling stock to be kept much cleaner. Paintwork is better preserved and the whole of the railway equipment requires less maintenance. Extensive studies have been undertaken by O.R.E. as regards the use of protective paints on structures and rolling stock. And finally, this modernisation is a blessing for all railway personnel. It provides cleaner and better working conditions for the staff and also makes it possible for both them and the management to work in a "modern world." The customer is also far more satisfied.

To obtain the full benefits of this modernisation it must be executed quickly. First dieselisation on the lines to be electrified, and then, as electrification proceeds, transference of diesel traction to the diesel lines.

(To be continued)

* Abstract of a paper presented on March 12 to the Railway Students Association by Dr. den Hollander who, although he has relinquished the presidency of the Netherlands Railways, has continued to occupy that post in the Office for Research and Experiments at Utrecht.

ELECTRIC TRACTION IN FRANCE



FRENCH RAILWAYS 179 PICCADILLY LONDON, W.1

PB61b

2500 h.p. per engine for

The 137 twin-bank SULZER Diesel Engines recently ordered through Crompton-Parkinson by the British Transport Commission are the most powerful engines being supplied to British Railways. Some of these engines will have a B.S.S. continuous rating of 2,500 H.P. at 750 r.p.m. and the balance will be rated at 2,300 H.P.

Illustrated above is a similar 12LDA28 engine, coupled to its Crompton-Parkinson main and auxiliary generators, as being supplied to an earlier British Railways' order.

Sulzer Traction Engines are built by Vickers-Armstrongs (Engineers) Ltd., at Barrow-in-Furness incorporating Sulzer Pressure Chargers manufactured by The de Havilland Engine Co. Ltd. of Leavesden, Herts.

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THE ASIAN HIGHWAY

From Caravan Routes to Modern Roads

By M. S. AHMAD, Chief of Transport and Communications Division, Economic Mission for Asia and the Far East

RECENT discussions and plans for an Asian highway to link the vast distances of the world's largest continent have served not only to emphasise the need for modern roads, but also to recall past explorers and traders who engaged in truly heroic exploits to open up land communications. Man has, of course, travelled since the dawn of time, and we can trace the movements of peoples from the inhospitable deserts of northern Asia through Turkestan into Iran and India, or through Russia into Europe. We likewise know of migration towards the Yangtze-Kiang valley and South China, or from the deserts of Syria, Arabia and Africa into the valleys of the Tigris and the Nile.

When civilisation advanced and a settled agriculture evolved, the pattern of movement was governed by trade needs. Iron, for example, had to be procured both for the manufacture of weapons and agricultural implements. Today one would shudder at the thought of the risks and privations that the traders of old faced in bringing their goods over long, often not well defined, hazardous caravan routes in journeys which lasted for months and even years. They fetched tin from England, copper ore from Spain, timber from northern Europe, iron from central Africa, Iran and India, spices from the Moluccas, silk from Sian Fu (China), cotton from Egypt and Mekran (now in Pakistan).

The Hard Way

The development of trade routes was by no means easy. The topography of Asia comprised vast plains (some fertile and some desert), numerous mountain ranges, including some of the highest in the world, and rivers mighty and long and often turbulent. The trade routes naturally sought out the mountain passes (most of them still in use) and followed the rivers. Where possible, caravan routes were preferred to the sea, where travellers faced the greater hazards of piracy and the elements.

The ancient route that connected Hamadan (ancient Ecbatana) in Iran with the then rich valleys of Mekran and of Luni in India passed through towns in which almost one of the oldest civilisation—Mohenjo Daro—once existed. This route to southern India fell into disuse owing to the drying up of the Kachh, Mekran and Luni rivers and to the creeping sands of Seistan created by volcanic action. The door to India via Kandahar and Kabul through the Khyber Pass still remained open. Yemen too was gradually cut off through the spread of the Arabian desert.

Towards Stability

There is no doubt that the establishment of great kingdoms greatly helped in stabilising and providing some security to trade routes and developing them, though the extent to which security could be provided was limited by the rulers' ability and power. The establishment of the Han dynasty in China, the rise of Cyrus and of Alexander the Great, the establishment of the Mauryan dynasty in India and the large-scale missionary efforts of Asoka—all helped towards stabilising the caravan routes and the trade pattern in Asia.

The great silk route, for example, started from Sian, the capital of the Hans, and passed through

The projected international highway system for Asia

Turkestan, Rhea and Hamadan to Europe either through Asia Minor or, with a slight detour, through Baghdad, Mosul and Antioch, dividing at the latter place for Egypt through Damascus. From the Khorasan cities of Herat, Nishapur, Merv and Balkh, routes took off for Quetta, Rohri, Loderva (Saisolmer) to the rich countries of Gujarat and central India and for Kabul, Lahore, Kanauj and on to Gaur (Lakhnauti). Trade through Burma was even then a mere trickle, since the sea route provided an easier alternative. South Indian contacts with Indonesia, Malaya, Siam (Thailand) and Cambodia were also by sea.

Roman Roads Stimulated Trade

The itineraries of world travellers like Ibn-i-Hakal, Fa Hien, Hien Tsiang, Ibn-i-Batuta and Marco Polo gave an idea of the then existing caravan routes and their condition. The Romans in the period 266 B.C. to A.D. 476 built roads which extended over three continents. These were built primarily for military purposes, but good communications with security of travel gave a considerable impetus to the development of trade and commerce. Exchange of commodities was carried on through Greece and Syria, and merchants travelled as far as Merv or Samarkand in Turkestan, Kandahar in Afghanistan and through the Khyber Pass over the road across north India to the Ganges plain. Chinese silks were brought over the long route from Sian Fu, the ancient capital of China. In the Byzantine Empire, trade with the East by caravan flourished. The Imperial power at Baghdad gave the Moslem world good roadways on which were serais or inns and provision for relays of mounts for traders, pilgrims and official couriers.

These roads, linked with those of central Asia and even of China, constituted the great trade routes between the East and the West. In this connection, it will be of interest to study some of the caravan routes existing in Asia from 1000 B.C. Through these international land communications, the Asian countries established contacts with the outside world without which trade and commerce would not have flourished and their civilisation would not have progressed.

Roads Backward in Asia

In Asia as a result of political developments over the centuries and the shifting of national frontiers, many of the land routes which had once connected Asian countries fell into disuse. Although attempts have been made from time to time to restore and develop some of the land communications, the results have been limited, due to lack of co-ordinated efforts. In the meantime, both Europe and America have, for some decades, been developing their international highways. The Pan American Highway—an 18,000-mile (28,960 km.) network from Alaska all the way to South America—is an unique example of an international highway in the true sense of the term. This road extends practically from the Arctic to the Antarctic and crosses the Tropic of Cancer, the equator and the Tropic of Capricorn. It winds over mountains to a height of some 15,000 feet (4,572 metres) above sea level, and threads its way through the green jungles of the tropics, and across rivers.

Since the 1939-45 war, the U.N. Economic Commission for Europe based in Geneva has endeavoured to facilitate road transport between the various countries of Europe by providing a common forum for the exchange of views and through international conventions and agreements. Steps have also been taken to standardise rules and regulations, customs formalities and road signs and signals to promote the smooth flow of international traffic and to reduce delays at frontiers. A working group has been engaged since 1947 to establish an international system of arterial roads to promote the economy of nations and to encourage tourism. Roads have been nominated for international traffic running between London and Turkey, between London and the Soviet Union and from Stockholm to Lisbon. Standards for these roads have been laid down, and they have been divided into three categories, with design speeds of 120 or 100, 80 and 60 km. per hour. The question of establishing a European investment fund is at present under study.

Role of Air Transport

In Asia, during the last decade, international civil aviation has played a major role in bringing together the countries of the continent but it is still beyond the means of the majority of people living in the area. There are a few international railway links, notably between Thailand and the Federation of Malaya, Thailand and Cambodia, and between India and the two wings of Pakistan. These, of course, serve an important purpose, but they can hardly be considered adequate. So far as the development of international highways is concerned, though there has been, the world over, a phenomenal increase in road traffic, with consequent attention to the improvement of highway networks, in Asia little progress has been made.

The importance of developing adequate international highway communications in this region has been fully recognised by the Highway Sub-Committee of the Inland Transport and Communications Committee of the U.N. Economic Commission for Asia and the Far East. At its third session in Manila in 1955, the Highway Sub-Committee requested the ECAFE secretariat to undertake studies on the improvement of existing communications and on ways and means of developing highway links over international borders. In a preliminary document, the secretariat proposed the development of an international highway network based, for the time being, on existing routes.

Proposed Route

Commencing with Iran, to the west the roads go to the border of Turkey, from where links exist to Europe, and to the borders of Iraq, where roads lead to Syria, Jordan, Lebanon, Saudi Arabia and the holy places of Jerusalem, Mecca and Medina. Starting from Teheran, there are two routes to the east; the first to Kabul via Meshed (Iran), Herat, Farah and Kandahar in Afghanistan; the second route from Teheran is to Pakistan through the Iranian towns of Qum, Nain, Kerman and Zahidan. This second route crosses the big desert Dasht-e-Lut, thus, an alternative route from Zahidan via Birjand, Gunabad and Turbat-i-Haidari to Meshed and thence to Teheran is also being developed. From Kabul the road passes over the Khyber Pass to Peshawar (Pakistan) and thence to Lahore. From Lahore the road continues to New Delhi (India). The route from Zahidan

(*Continued on page* 22)

From the Drakensbergs to the Great Karroo

South Africa's dairy industry rides high on Austins

In South Africa the dairy industry is young—but growing fast. Since the end of World War I it has developed steadily and now accounts for £42.5 million of the nation's income. Today people in the Union drink 170 per cent more milk than in 1937. Cheese production has almost doubled in the last 10 years. Enough butter was made in 1957 to export over 7 million pounds to other African territories, to the U.K., to Italy.

Largest dairy producers

Bowkers Park Creamery Ltd. are the largest dairy producers in Cape Province. This farmers' co-operative society started as a small butter factory in 1903; and by 1921 had built the present factory at Queenstown. As the industry expanded so did Bowkers Park Creamery. By 1929 branch factories were being set up and the Company was among the first to export butter. Today they sell 6 million pounds of butter a year, 1½ million of cheese, and over 20 million gallons of milk.

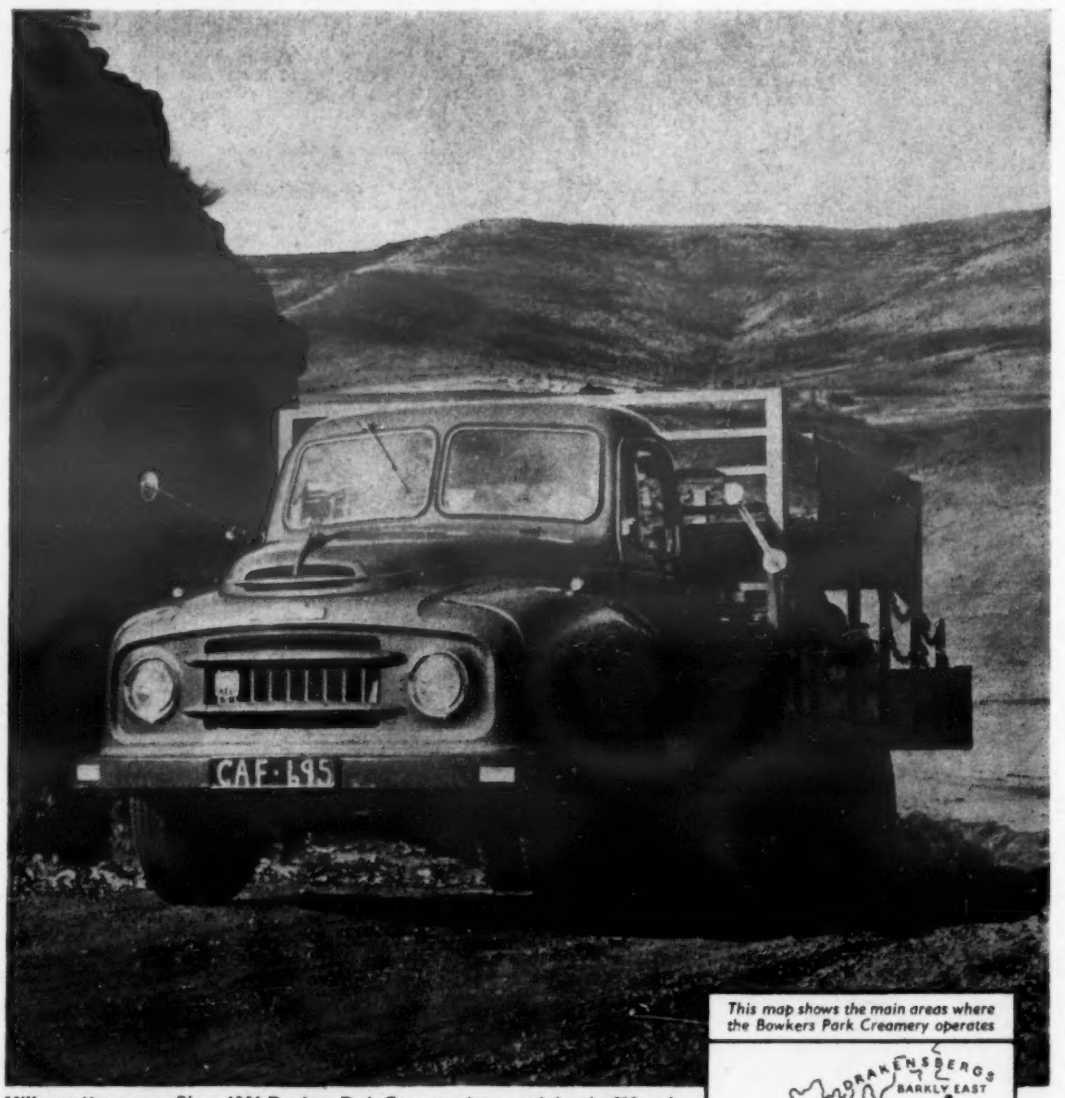
Milk on the move

Main production centres are at Queenstown and at Barkly East, 6,000 feet up in the Drakensberg Mountains. Every day thousands of gallons of milk are on the move ; milk collected by the Bowkers Park fleet of Austin trucks from farms around Grahamstown and King Williams Town, farms in the Cradock and Barkly East Districts. Daily mileages are often over 100, and 2,000 is a monthly average. The twenty Austins travel from sea level to over 10,000 feet up ; from farm to factory, factory to railroad and dockside; from the Great Karroo plateau to the Drakensberg Mountains on the borders of Basutoland.

Danger in the Drakensbergs

From May to September the lofty Drakensbergs are snow-capped. Roads here are rough and difficult, twisting in and out of the ranges with steep gradients and long heavy pulls for the loaded trucks. In wet weather (and this area has one of the highest rainfalls in the Union) the roads are rivers of mud. Then heavy chains have to be fitted to wheels before the Austins can grind their way through the slushy, slippery mountain passes to reach the farms beyond.

How do Austins stand up to these conditions? The General Manager, Mr. G. Bouwer, says, "We have found this make of vehicle most satisfactory from both an economical and performance point of view. These vehicles have proved themselves able to stand up to heavy work—more especially in the mountainous area around Barkly East."



Milk on the move Since 1956 Bowkers Park Creamery have used Austin 503 and 701 trucks exclusively. In that time many of the vehicles have reached over 100,000 miles with very little maintenance. Some engines have never been touched.

This map shows the main areas where the Bowkers Park Creamery operates

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BRITISH RAILWAYS AND THE TRADER

Requirements and Their Fulfilment

1—WHAT A CUSTOMER WANTS

Two interesting and informative lectures were recently delivered to British Railways (London Midland Region) Lecture and Debating Society dealing essentially with the relationship between the railways and their customers. Both are worthy of a larger audience and we have so persuaded their authors. The first was Mr. E. G. Whitaker, Transport Adviser, Unilever, Limited, who discussed the railways from a customer's standpoint. The other was Mr. E. W. Arkle, Director of Traffic Services, L. M. Region, who spoke from the railway angle. We begin this series with an abstract of Mr. Whitaker's paper.

CERTAIN general principles must obviously be borne in mind when considering any form of transport, whether it be rail, road, water or air. Simply stated, they are (1) that each form of transport should be so developed and exploited that the sum total of the activities of all forms constitutes an efficient transport system produced at the lowest possible cost to the community; (2) that co-ordination, or integration, is justified only if it results in greater efficiency and/or reduced overall costs than would otherwise be the case. (It could not, in any case, be justified if there were no provision for a fair measure of competition); (3) that the charges made by all forms of transport should be related as closely as practicable to the cost of providing particular services.

It is exceedingly difficult to determine the true costs of each form of transport, including those which relate to the use of the tracks, and numerous Commissions and other bodies have given this matter much thought without any real success. It is most important that the various means of transport—particularly in a competitive situation ---should be dealt with as fairly as possible in this respect. It would undoubtedly be a very complex exercise to attempt to assess total track costs, and those which should, for example, be allocated to freight transport having regard, in the case of the railways, to the common use of most routes for both freight and passenger traffic in varying degrees, and, in the case of road, use not only by both freight and passenger vehicles (both commercial and private), but also by pedestrians, and for other services such as gas, electricity, and telephone cables.

Despite the difficulties, however, I am sure that much greater effort should be made to find a solution which may, in the end, represent a reasonable compromise rather than precise calculations. It is only when the best answer possible has been found to the problem that right decisions will be able to be taken as to the proper division of function between the various forms of transport, and as to the degree of co-ordination, or integration, which may be desirable in order to achieve the best results.

Transport and Politics

Unfortunately, over the past 12 years or so, transport has been a shuttlecock for politicians, and in consequence providers and users alike have perforce had to concern themselves with political considerations. Both would be immensely relieved and gratified if transport were removed from the political field.

In 1946 the Labour Government decided to give effect to their policy of nationalisation; the 1947 Act resulted. Then, under the present Government, the policy of endeavouring to provide, through public enterprise, an integrated system of inland transport and port facilities was deliberately abandoned in 1953. Hence, it became necessary to restrict the powers of the Commission, and it is now their general duty "(*a*) to provide railway services for Great Britain, and (*b*) to provide or secure the provision of an adequate and properly co-ordinated system of passenger transport for the London Passenger Transport Area."

The Commission's responsibility for providing other transport services is limited to "such places and to such an extent as may appear to the Commission to be expedient." It remains the duty of the Commission to have due regard to "efficiency, economy and safety of operation and to the needs of the public, agriculture, commerce and industry," but the requirement to provide an adequate and properly integrated system of public transport has been dropped.

The whole of the business of the Commission is to continue to form one undertaking. It must be conducted so as to secure that the revenue of the Commission is sufficient for meeting the charges properly chargeable to revenue, "taking one year with another," and rates, fares, etc., must be levied accordingly. The Act does not say that the budget of any service taken by itself must be made to balance, and it appears that a surplus on one service can be set against a deficit on another. Nor are the financial duties of the Commission affected by the policy of railway decentralisation inaugurated by the 1953 Act.

Decisions regarding both the 1947 and 1953 Acts were based more on political than on economic or commercial considerations, the governing theme of the latter being that each form of transport should find its own level by process of competition, no apparent attempt having been made to ascertain whether any advantages had arisen from integration under the 1947 Act, or from the activities of the Road Haulage Executive.

The Customer's Yardsticks

As a customer, I can use only the yardsticks which are available to me for determining the method of transport which should be employed in any given set of circumstances. There are two main yardsticks—service and cost. Under service there are such considerations as reliability, frequency, regularity and speed, and it is relatively easy to decide which form of transport provides the best service. But cost is not so readily assessable, even when (in the case of railways) the charge includes collection a..d delivery. Cost in the sense I have in mind is the cost from the end of the production line to the point at which I cease to be responsible for it. If, for example, the cost between the end of the production line and dispatch vehicle is less for one form of transport than for another, I must take this into consideration. Other examples are differences in the cost of packing material and labour for packing, claims for damage, short delivery, etc.; it is insufficient merely to compare the actual rail and road rates, even if they cover the same services which is not always the case.

The Transport Act, 1953, broadly requires that the railways should be exploited and developed competitively with other forms of transport. In conformity with this the railways (with the support of leading trade associations) were relieved of a number of their former obligations, and now:

(1) Only maximum freight charges are statutory.
(2) The railways have full power to quote rates at their discretion below the maxima.
(3) They may make such charges as may be reasonable for consignments of 100 tons and upwards, and for owner's wagon traffic, for which maximum rates were not fixed.
(4) The requirement to publish rates applies only to maximum charges.
(5) There is no obligation to treat all traders alike, and there is now no risk of legal actions for undue preference.

Whilst it is understood that the railways still have an obligation to carry, within the capacity of their facilities, all the traffic which may be offered to them—with certain limited exceptions—this cannot be regarded as a hardship in circumstances in which they are free to fix charges which cover the cost of the service provided.

Railways Not a Social Service

A surprising number of railway officers still seem to feel they have an obligation to provide facilities to meet social services, or the needs of some industry or geographical area, even when the response would be inadequate and the services unremunerative. Should they not now acknowledge that this is not their responsibility and that only if they are directed to give such facilities should they provide or continue to provide them? In a competitive situation should not the railways be regarded as a business undertaking, and not as a social service? The chairman of the Commission clearly thinks so. In the *Financial Times* of August 18, 1958, Sir Brian Robertson wrote:

"Modernisation is not achieved merely by buying or making large quantities of new technical equipment. It requires also a streamlining of organisation for management, salesmanship, operation and technical services. Added to this, we need, and in large measure are obtaining, the co-operation of our staff and of the trade unions in seeking greater productivity. Last but not least, we need to shed the remaining outmoded obligations and restrictions for which there is neither necessity nor place in a modern railway system that is being asked to pay its way."

Unremunerative Traffic and Subsidisation

This brings me right into the field of unremunerative traffic and subsidisation. In my opinion whoever requires the railways to provide unremunerative services should themselves pay a direct subsidy sufficient to meet the deficit, and should not except the railways (or some of their other customers!) to cover the cost by cross-subsidisation.

It has been argued that as a number of industrialists, including my own company, sell their goods throughout the country on a fixed price basis when, obviously, the price does not cover costs in the more thinly populated areas, the railways should do likewise, and that, in fact, the railways are "on all fours" with industry in this respect. This, I suggest, is true only if the railways are really in the same position as industrialists, having themselves the power to decide where, in their own interest, and having regard to their general commercial policy, they will continue to provide services which are unremunerative.

To take the argument a stage further—if, as does happen on occasions—an industrialist finds that a product is not providing an adequate overall return, he can withdraw it from the market. The railways, in my opinion, should be able to practise the same right. They really cannot afford to subsidise any section of their activities seeing that they must be competitive over a very wide field if they are to attract traffic.

Competition Must be Faced

Whether we like it or not—and as a customer I like it in reasonable measure—competition exists in inland transport. This being so, it seems obvious that the railways must become more commercially minded and more competitive. In many directions there is much evidence of this, but the view still seems to be held by a good many in the railway service that the railways should receive traffic as of right. Surely strenuous efforts should be made to eradicate this kind of thinking wherever it lingers.

Let us face it—the railways must *earn* their traffic. The principal competitor is road, and it cannot be too strongly stressed that it will require considerable effort to attract to rail much of the traffic which is now passing by road, some of which was lost to rail in adverse circumstances, such as the last war, railway strikes, etc., whilst some has never passed by rail, notably from the many new industries which have developed during the last two decades.

Advantages of Road Transport

What are the railways up against in competing with road transport? First, there is the personal relationship between the road haulier and the customer. You may be surprised that I have placed this first, but I am sure it is extremely important in the many cases where the relationship between the haulier and the customer is on a close personal basis—far more so than is usual between the customer and the railway management, even the local management. There are indeed cases—particularly in some of the new industries—where the road haulier has grown up with the customer's business and is considered part and parcel of it. He, therefore, is in a privileged position in that he knows the customer's needs intimately, and may be so much in the customer's confidence that he is conversant with the policy of the business, and with any plans for expansion. In consequence, he is able to plan his own developments accordingly.

Secondly, there is speed and reliability of service from door to door; for full load traffic by road an overnight service from door to door is the normal practice. Thirdly, there is the reduction in damage and loss with a resultant decrease in the cost of dealing with claims, and in the annoyance these cause to both the sender and his customer. Fourthly, missing goods can be quickly traced, as often can the responsibility for any failures in the service and, fifthly, there is the factor of the reputation of the transport manager.

There are cases where the transport manager's reputation has been built up on the advantages he has been able to secure for his company from the services he has obtained from road transport. In such instances it is quite understandable that the transport manager may not be prepared to take what he quite reasonably considers to be a risk of prejudicing his company's and his own interests in transferring traffic to rail.

(To be continued)

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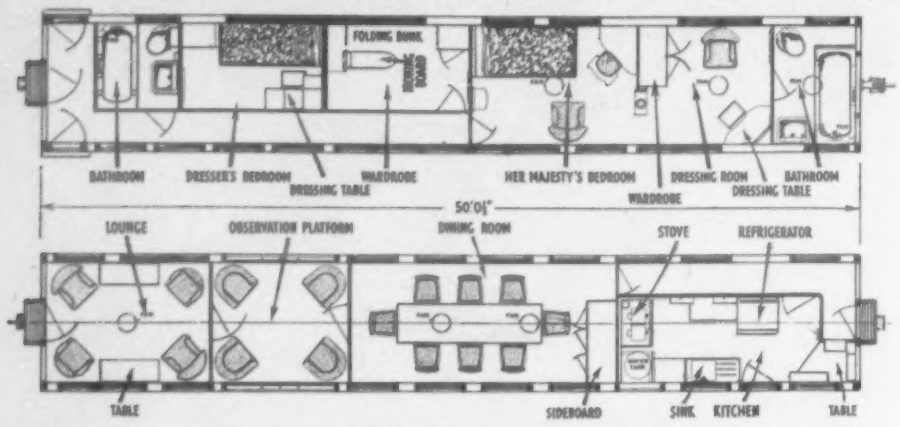
P.12

EAST AFRICA

Successful Royal Train Journey

LONG-DISTANCE BUS SERVICES

THE recent visit by H.M. Queen Elizabeth, the Queen Mother, to East Africa placed a great deal of responsibility upon the East African Railways and Harbours Administration both in moving Her Majesty from place to place and in providing adequate accommodation over several nights for the whole royal party. For the greater part of the journey which began on February 12 at Nakuru and finished at Naivasha



The arrangement of the night and (below) day coaches in the East African Railways royal train for H.M. the Queen Mother

on the morning of February 16, the train comprised 19 coaches hauled by two 60 Class Beyer-Garratt locomotives. The leading three coaches were occupied by railway operating and catering staff and police, and next came a restaurant car. This was followed by two coaches for the Governor's party and then the coach of the Governor of Kenya. The two coaches for Her Majesty were next in the make-up with the night coach leading and thereafter came two coaches for the royal party, a service coach, a twin-dining unit, three coaches for the press party and the guard's van.

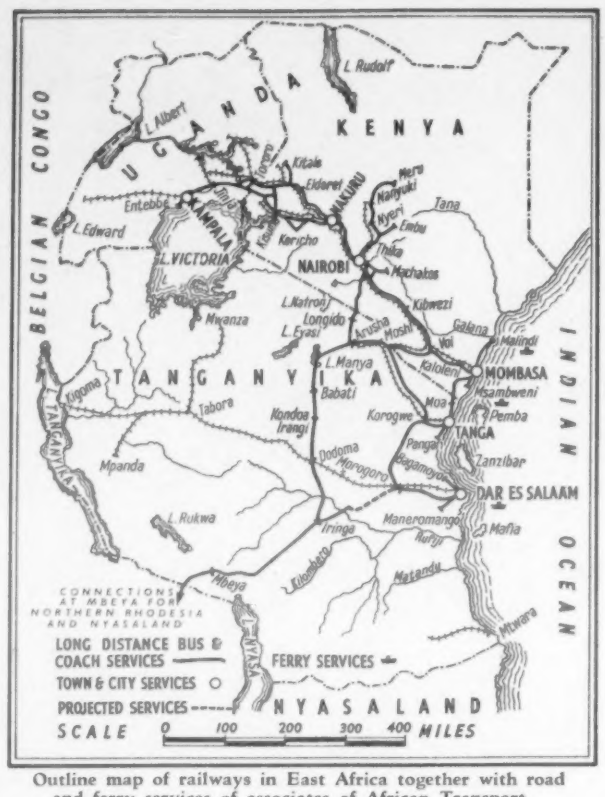
The two royal coaches were actually those built some 40 years ago for the use of the Governors of Kenya and Uganda but both were substantially refurbished and renovated. The night coach was, indeed, entirely redesigned to give within the limits of metre-gauge coaches, an impression of restful spaciousness. The colour scheme adopted was pale green and mauve-grey with natural mahogany panelling. As will be seen from an accompanying drawing the coach also included accommodation and a workroom for a dresser. The day coach comprised a lounge, an observation platform, dining-room and kitchen. All the royal rooms were panelled in Burma teak. The observation platform had pale lemon cushioned wicker chairs and blue-grey rubber flooring. The lounge was close-fitted with dark green carpeting, the furniture being upholstered in blue damask, while the curtains were in a beige star design. The dining-room, which had deep wine-coloured carpeting to set off the table and its decorations, had silver-grey upholstered chairs and curtains and sat eight people.

The service van, to which reference has been made, bore no resemblance to its normal appearance, having been modified to incorporate a hairdressing saloon, an office with a five-line telephone switchboard, an ironing-room and a cold store.

The whole operation proved most successful and when she finally left the train at Naivasha, Her Majesty thanked not only those who had travelled on the train but also representatives from the shops at Nairobi which had carried out the renovation of her coaches. She told Mr. G. P. G. Mackay, chief operating superintendent, E.A.R. and H., that a journey by train such as she had made was the ideal way to travel.

Long-distance Bus Services

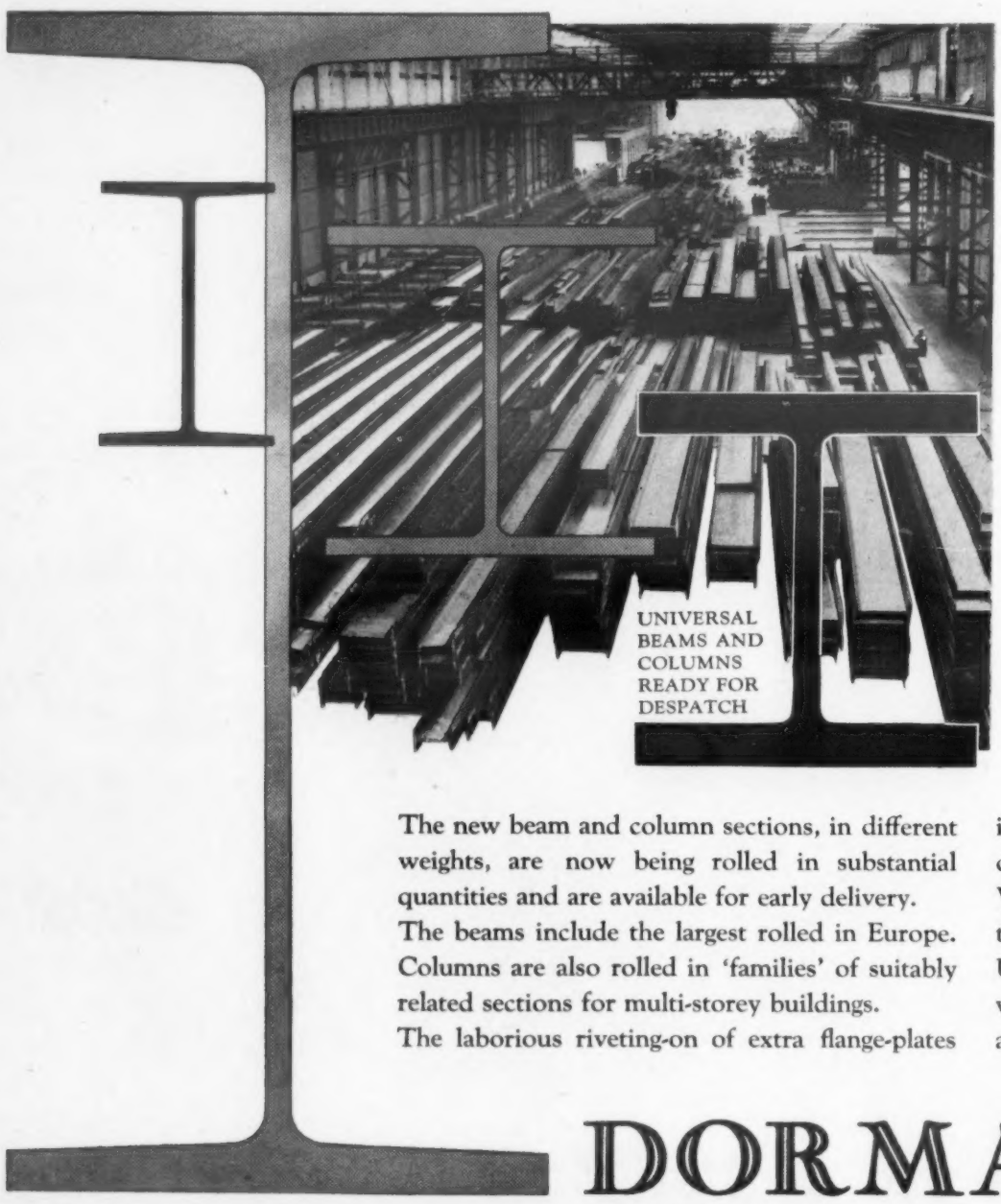
While attention has latterly been concentrated upon the royal visit, many of the people in the crowds which flocked to Nairobi and other centres were carried by special bus and by the regular services which have been developing steadily in East Africa. The African Transport Co., Limited, which already has local transport interests in the territories had, through its subsidiary, the Overseas Touring Co. (E.A.), Limited, developed a number of long-distance road services. Last year these were transferred to a new company, O.T.C. Road Services, Limited, and this has been developing them still further. A revised timetable last November introduced the practice of numbering the routes. These are as follows: (1) Nairobi—Thika — Fort Hall — Nanyuki (daily—first and second class); (2) Nairobi—Nakuru—Kericho—Kisumu (thrice-weekly — first class); (3) Nairobi—Nakuru—Eldoret — Kitale (thrice-weekly —first and second class); (4) Nairobi—Arusha—Moshi (daily —first class); (5) Nairobi—Mombasa (daily—second and third class three days a week and upper and third class four days a week); (6) Arusha—Moshi—Tanga (daily —first and second class); (7) Nairobi—Arusha (daily—second class); (8) Nairobi—Machakos—Makindu—Kibwezi (daily—first and second class); (9) Arusha—Moshi—Mombasa (daily—first and second class); (10) Nairobi—Kisumu—Kampala night service (four times weekly—first and second class); (11) Kisumu—Busia (daily—first and second class); (12) Nairobi—Dodoma—Mbeya (monthly — first and second class); (13) Nairobi—Arusha — Korogwe — Dar es Salaam (twice-weekly jointly with Dar-es-Salaam Motor Transport Co., Limited, first and second class); (14) Kisumu—Bungoma—Tororo (daily—first and second class); (15) Nairobi—Nyeri—Nanyuki—Meru (thrice-weekly—first and second class); (16) Nairobi—Fort Hall—Embu (twice daily to Fort Hall, daily to Embu—second class); (17) Nairobi — Machakos (hourly jointly with Commercial Bus and Transport Co., Limited, Mora Natha and Company, and Ukamba Stores, Limited); Nairobi—Nakuru—Kisumu (twice-daily jointly with members of the Nairobi Bus Union—second and third class); (20) Nairobi—Fort Hall (daily—second and third class).



Outline map of railways in East Africa together with road and ferry services of associates of African Transport

The timetable booklet in which these services are set out is incidentally admirably produced. The fares are set out for all the stages and all the classes and there is an introductory note in Swahili as well as English. On all the longer services there are breaks in the journey for meals or refreshments. Apart from the night service between Nairobi, Kisumu and Kampala various other long routes operate through the night as well as the day such as the joint one between Nairobi and Dar es Salaam. It will be noted that, while some provide cross-country links, other services parallel the railway.

Part of Her Majesty's lounge in the train showing the radio and telephone equipment; the royal bedroom



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Universal beams have opened a new field for steelwork designers, offering far-reaching economies and increasing the efficiency of the structure.

DORMAN LONG

A LOST EMPIRE OF THE INTERURBANS

Last of the Pacific Electric

COMPLETION OF TURNOVER TO BUS OPERATION

THE closing of the standard-gauge line between Los Angeles and Long Beach, scheduled to take place this summer, will mark the end of the world's largest interurban railway. This 20-mile stretch of line, most of it on private right of way, is all that today remains of the network of 1,164 miles of electrified tracks which for several decades provided cheap and convenient transportation between scores of towns in Southern California. Furthermore, it provided transport at a faster rate, in many instances, than is now possible by private car or express bus, even making use of the web of freeways.

Origins

The system, to become famous as the Pacific Electric—a name which has passed into history so far as passenger transport is concerned—owed its inception to one man, Henry E. Huntington. He came of a distinguished railway family; his uncle, Collis P. Huntington, was vice-president of the former Central Pacific Railroad, and one of the "Big Four" whose courage and determination had pushed to completion the western portion of America's first transcontinental railway over the High Sierra. Henry Huntington organised the Pacific Electric in 1901. Known then as the Los Angeles Inter-Urban Railway, it was intended primarily as an interurban passenger service radiating from the city of Los Angeles. Lines which were merged into the system included the Los Angeles to Pasadena, which opened to business back in 1893, just after the pioneer interurban from Portland to Oregon City.

Southern Pacific Affiliation

Control passed in 1910 to the Southern Pacific Railroad, and the following year the company was consolidated with various other electric railway properties, also controlled by Huntington, in the four southern California counties of Los Angeles, Orange, Riverside and San Bernardino. The new company, under the name of Pacific Electric, found itself responsible for the most diversified operation of local street car, suburban and interurban transport anywhere in the United States. Not only was it expected to provide adequate domestic services for long-established cities, but also in many instances to connect them across barren terrain.

Factor in Population Pattern

Within a few years the Pacific Electric had become a dominant factor in the pattern of population growth in southern California. The company's tracks linked downtown Los Angeles with the widespread beach resort area between Santa Monica and Cliffton in the west and with the harbour and beach areas from San Pedro to Balboa in the south-east, a coastline of some 65 miles. Its big red cars were to be seen negotiating rugged canyons en route to mountain resorts, and among the orange groves and the sugar beet, celery and bean fields between the city of the Angels and communities as remote from the metropolitan area as Santa Ana, 34 miles to the south-east, and Redlands, 72 miles to the east. It linked some 130 cities and communities.

Admittedly some of its lines were built to assist its founder to promote certain real estate deals in which he was interested; nevertheless, the resulting network of lines interlocked in such a way as to make the whole of the vast area readily accessible. Much of the company's track was on private right-of-way, and, being a railroad, its cars were not obliged to stop for road traffic and crossings. Schedules were therefore fast and frequent, and fares averaged less than three-quarters of a cent per mile. Some 2,700 trains were scheduled to run each weekday on the interurban routes.

Tourist Facilities

Throughout its existence the P.E. was a purveyor of tourist and recreational facilities on a grand scale. Chartered excursions for Sunday School outings and the like were commonplace, but still more common were the day-long tours to the beaches, to tourist spots such as the Mission San Gabriel, and to the Orange Empire. With the inclined railway line up Mount Lowe, to the north of Pasadena, and the combined rail-steamer trip to Catalina Island, 22 miles out in the Pacific Ocean, these excursions for many years provided the tourist view of southern California—and, in most cases, the residents' view as well.

The Mount Lowe excursion was world famous. It was operated for well over a quarter of a century. Several trains left Los Angeles Main Street Station daily for Rubio Canyon (1,950 ft.) where passengers transferred to the inclined railway, which carried them past Mount Lowe Observatory to Echo Mountain—a rise of 1,325 ft. in 3,200 ft. travelled—and on to the Alpine Tavern (4,420 ft.), a rest house owned by the company. From Alpine the more adventurous could proceed by mule or pony to the summit, 1,100 ft. higher. The round trip for this scenic ride, which must have been unsurpassed in the annals of suburban operation, cost only two dollars. Other full-day trips, such as the Old Mission Tour, with reserved seats in a "parlour car," cost only one dollar.

Race Specials

With the opening of the race track at Santa Anita in 1934, regular race "specials" were added to the normal operations. Another innovation which came at about the same time was the running of the so-called *Club Car Commodore*, a limited-stop service by parlour car fitted with individual leather armchairs, for well-to-do commuters from the Newport Beach area. "Limiteds" were, of course, a regular feature on most of the longer runs, although none was as luxurious as the *Commodore*. In another field entirely, the Pacific Electric was linked with a name which can still conjure up the "romance of the West"—Wells Fargo. The company carried express baggage on behalf of the Wells Fargo company.

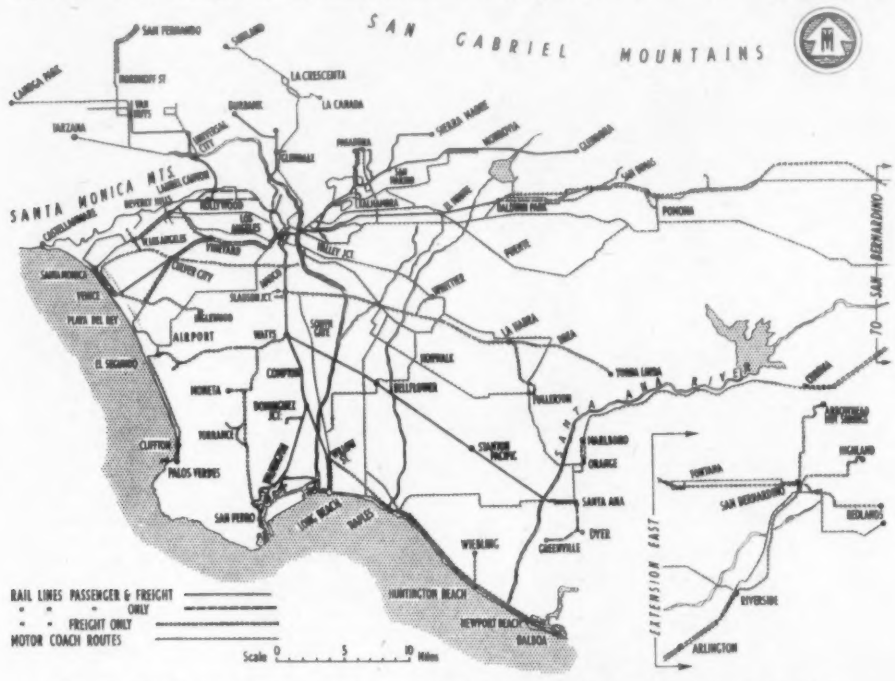
With such widespread and diversified operations, it is surprising that the company seldom found itself making a profit at the end of a year. Several factors appeared to have had some bearing on this state of affairs, but first it might be as well to clarify the conditions which gave rise to the emergence of the company. In common with other interurban systems in the United States, the Pacific Electric came into being to fill a need; its decline started when that need no longer existed, or at least to nothing like the same extent. As the name implies, interurbans made runs between cities. In most cases these cities were already linked by steam lines whose long-established routes had been well

(*Continued on page* 10)

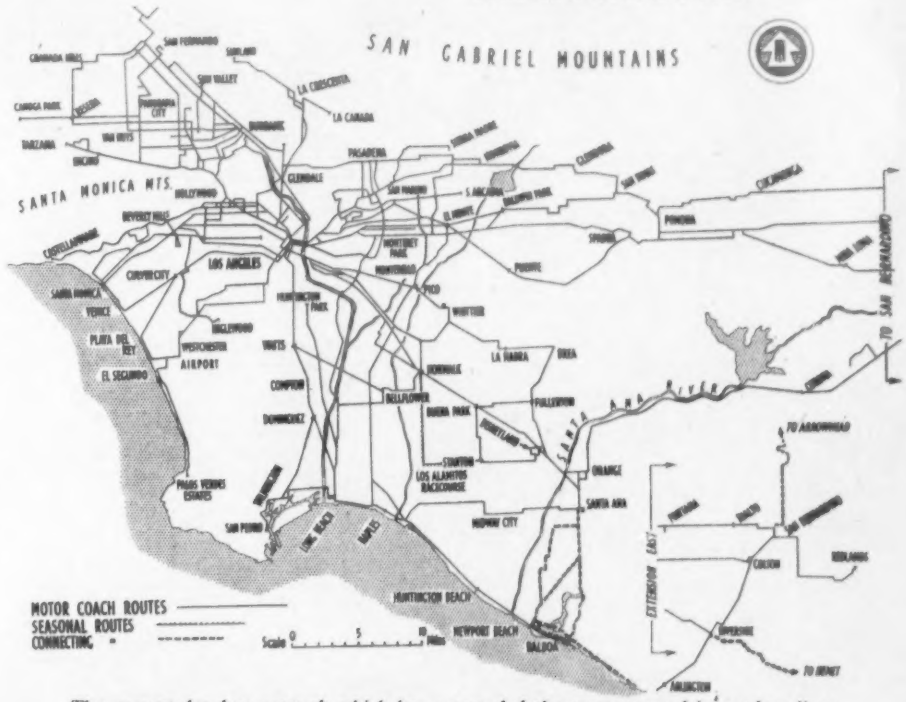
Time was, between 1893 and 1920, when the interurban electric railway spread all over the U.S.A. There were 18,000 miles of route and dense networks in New England, Indiana and California. The private car, the jitney bus and present-day operation of buses brought about their disappearance. This is the story of the largest single system, the Pacific Electric

Photograph] [Title Insurance and Trust Company

In 1900 on the Mount Lowe Railway, which was built by Professor Thaddeus S. C. Lowe

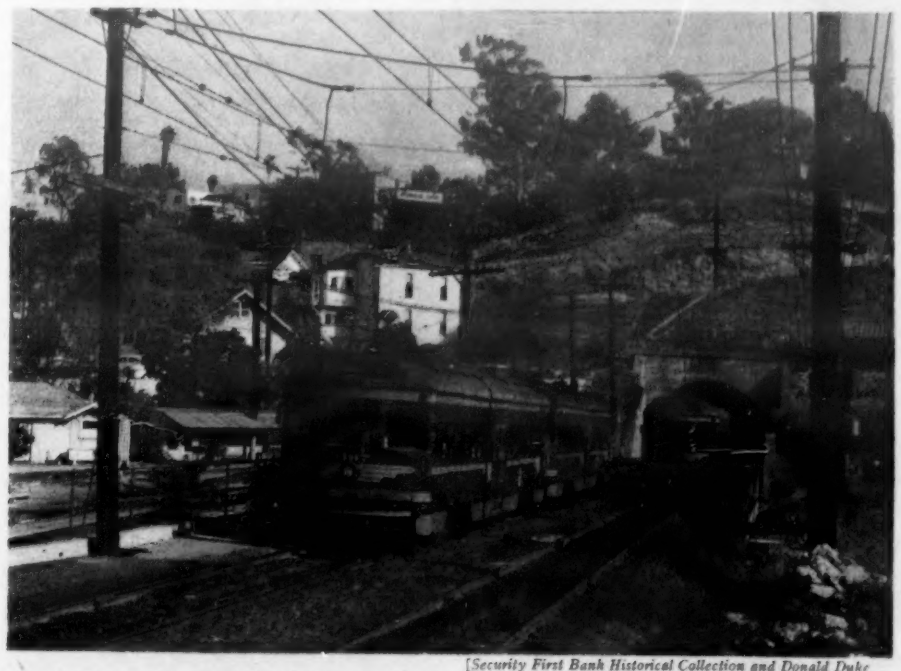


The Pacific Electric Railway routes in their heyday; Mount Lowe is north of Pasadena



The present-day bus network which has superseded the tramway and interurban lines

The buses of L.A.M.T.A. that have replaced the interurbans, seen at Hollywood Bowl. The outside vehicles are routed by the Hollywood Freeway, built on an alignment close to the interurban route through the Cahuenga Pass to North Hollywood and Van Nuys



Photographs] [Security First Bank Historical Collection and Donald Duke

In a Los Angeles street about 1910, with a Pacific Electric car bound for Mount Lowe; the car on the left is a Los Angeles Railways 3 ft. 6 in. gauge vehicle on local service; right, Glendale two-car train emerging from tunnel on the Pacific Electric Railway near Beverly Boulevard

Passing of Pacific Electric

(*Continued from page 9*)

chosen. As a result, the rural interurban tracks (usually called trolley-car tracks in America) more often than not paralleled the steam tracks, branching off only at city limits to join the city local tramway system. Because of its acceleration and ability to operate as a single unit with a small crew, the interurban fulfilled the dual role of carrying local traffic originating between cities, and of acting as feeder to the main-line railway for persons who wished to travel farther.

The High-Speed Highway

Before the coming of the mass-produced automobile, American rural roads were maintained by local authorities to various standards (and in many cases deplorably low standards) of repair, with the result that from its introduction towards the close of the last century the interurban provided the only high-speed highway between cities. It blossomed most spectacularly in the rich, flat farmlands, particularly in the Middle West. The largest interurban terminal in the United States was at Indianapolis, where there were many independent lines. On the other hand, the impoverished South, the settled East and the arid and mountainous West had very few. Southern California provided the exception, a state of affairs due largely to the richness of agriculture of the Los Angeles basin.

To some degree, and no doubt unwittingly, the Pacific Electric was instrumental in bringing about its own demise. The reliability and excellence of its services at a time when competition from road traffic was negligible caused it to play a large part in the growth of outlying communities. But this growth continued to develop at an ever-increasing pace, and as more and more citrus groves became replaced by housing estates the P.E. found itself having to choose between turning itself into a "rapid transit" system, or pursuing its chosen path even at the risk of eventual replacement by some other form of transport. In the event, the company contented itself with opening more branch lines to serve the Huntington estates. Perhaps had a more positive approach been made to the problem, Los Angeles and district might well today have possessed a rapid transit system second to none. As it is, the surviving remnant of this one-time vast enterprise is on the point of joining all the other American interurbans in whatever limbo exists for defunct transport enterprises.

Congested Los Angeles

The development of the Greater Los Angeles area, to which it had contributed in such measure, was undoubtedly the main cause of P.E.'s eventual decline. The Federal interstate highway programme of 1924 accelerated in the 1930s to provide employment, coupled with the low cost of private cars and petrol at the time, marked the beginning of the end for all American interurbans. Despite the writing on the wall, however, the company appeared untroubled about the future, and its lines and rolling stock were continued without perceptible modification well into the 1930s, by which time the local transport load was much greater, and the traffic jams caused by motor traffic of tremendous proportions. Traffic jams were not new to the P.E. While the company was pursuing its programme of pushing out more and more widely-scattered extensions, very little had been done at the heart of the system, in downtown Los Angeles. In the early 1920s it was said to take as long to cover a few city blocks as it did to get to the city from communities a dozen miles away. This position was alleviated for a time by the introduction of a section of subway under the heart of the congested area and the provision of an underground terminal. Motorists today complain of a similar bottleneck, but this time it is said to take as long to get off one of the freeways at the downtown interseotion as it does to get to that point from places several miles distant.

That P.E. was able to continue for so long was due largely to two factors. First, the area's fast growing industrial development made the various rail routes increasingly important for freight traffic. The Pacific Electric therefore acted as a freight feeder for its parent company, the Southern Pacific. Being an interurban, it was able to extend into areas already served by the Union Pacific and Santa Fe lines and therefore closed to Southern Pacific. In fact, some of the P.E. services were combined passenger and freight workings. Secondly, forced by circumstances rather than spontaneously, its management increasingly turned to the use of buses, first as feeders to the rail lines and later as substitutes for them. By the end of the 1939-45 war more than half the P.E. operations were by bus.

Richardson car waiting on Southern Pacific interchange track at right while Los Angeles-bound train of Pacific Electric P.C.C. cars passes

Rolling Stock

During its lifetime, the P.E. owned and operated cars of many types and sizes. They ran as singles, in pairs and in threes. For excursion work, as many as six and on rare occasions 10, were to be seen coupled together. From 1905 onwards, Henry Huntington had a luxurious private saloon of his own, with four 200-h.p. motors and a top speed over 90 m.p.h. It had two bedrooms, a kitchen and a dining saloon. After 1918 it was derelict and then ran till 1931 on the Sacramento Northern for special parties. From the very early days, multiple-unit operation was adopted. The largest cars to be run by the company were the present steel 80-passenger Long Beach cars, built for the Southern Pacific's Bay Area operations from 1907-model plans. This operation terminated just prior to the last war when the Brotherhood of Railway Trainmen demanded railroad crews (four men to a car) instead of interurban crews (two men to a car). They were transferred to Los Angeles during the wartime shortage of private cars. The local streetcar services in Los Angeles are, however, of 3 ft. 6 in. gauge. Nevertheless, the 80-seat 4 ft. 8½ in. gauge cars were retained in service because of their capacity; as a result Los Angeles is the only American city still using electric cars of two gauges on the same street with a common third rail and trolley wire.

Of the Pacific Electric stock one of the finest types was the all-steel 1200 class, built in 1914, used on the 65-mile route from Los Angeles to San Bernardino and Riverside. They had four 140-h.p. motors, a top speed of about 60 m.p.h., and a tare of 46 tons. With seats for 60 they often ran in three-car trains. The coupling between the cars automatically connected up the air brake pipe and the control line for multiple-unit operation. On November 24, 1940, a batch of 30 P.C.C. cars went into service. The modernisation then embarked upon included rebuilding of 160 older cars and purchase of 85 buses. The P.C.C. cars were built by Pullman-Standard and were double-ended; the overall length was 50 ft. 10 in. and the width 9 ft. There were 50 permanent and eight folding seats. The weight of each car was about 19 tons, a great reduction over that of the 1200 class. There were four 55-h.p. motors driving through propeller shafts and hypoid gears. The finish was in red with orange trim and silver roof.

Competition

Increasing competition from private cars, coupled with constantly rising costs, depressed the passenger service into a number of years of deficit operation. In October, 1953, therefore, the passenger services, by then predominantly by bus, were disposed of to a new company, Metropolitan Coach Lines, leaving only a 336-mile freight system, which continues to operate as a separately run subsidiary of Southern Pacific. There was always a close liaison between the two companies. In fact, S.P. used a spur line at Exposition Park, in Los Angeles, to display its various "named" trains as a public relations routine before each went into service.

Among such trains, to be seen rather surprisingly in a main street on an adjacent track to local tramcars, were the first of the streamlined *Daylight* specials, and also the Santa Fe company's *El Capitan*. On the Pacific Electric, too, the Southern Pacific carried out the first test of the revolutionary innovation of providing local store-door pickup and delivery of less-than-carload freight loads as a means of meeting competition from long-distance road hauliers. Out of these operations grew the Pacific Electric Motor Transport Company in 1929, the word "Electric" being dropped from the title when the service was extended the following year to points on the Southern Pacific well away from the P.E. system.

Bus Substitution

Metropolitan Coach Lines had only a short innings. With its subsidiary company, Asbury Coach Lines, and the Los Angeles Transit Lines, its undertaking passed to the Metropolitan Transit Authority in March last year. Of the two former interurban lines taken over by the Authority, one, that to San Pedro, was replaced by buses in December, 1958. The Long Beach line therefore constitutes the West's remaining interurban. The imminent replacement of its big red cars, running for most of the journey over private right of way, by *Freeway Flier* buses using already crowded streets, will bring to a close a colourful chapter in American transport history.

Today, buses are carrying out most of the functions previously performed by the Pacific Electric. However, at a time when the general area has the doubtful distinction of being the most smog-polluted in the nation, it will be for posterity to judge whether in the long run some of the millions of dollars which have been poured into freeway construction might well have been diverted to modernising the old P.E. and eliminating most of its level crossings. A recent survey carried out by the Transit Authority produced a rather unexpected result; an overwhelming number of daily travellers questioned said that a fast and comfortable ride was more important than a cheap one. It would seem, therefore, that the time has come for transport men to adopt an entirely different philosophy —even though it would be of no avail, now, to American interurbans in general, and the Pacific Electric in particular.

A new ocean-fed terminal, costing over £1,000,000, is being built by Mobil Oil Co., Limited, at Ellesmere Port, Cheshire. The terminal is situated 2¼ miles from Queen Elizabeth II Oil Dock at the entrance to the Manchester Ship Canal. From this oil dock, vessels from the Mobil Coryton refinery will discharge their cargoes by pipeline to the new terminal. One result will be to permit for the first time the distribution and sale of Mobil fuel oils in North-West England. The marketing of industrial and domestic Mobil fuel oils will be undertaken by Charrington, Gardner, Locket and Co., Limited. The main contractor is John Laing and Son, Limited, which as far as the mechanical and electrical work is concerned are in association with the H.K. Ferguson Company of Great Britain, Limited. It is hoped to complete the installation by the autumn.

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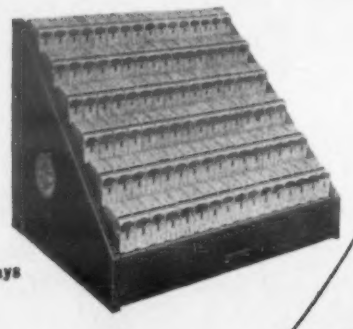

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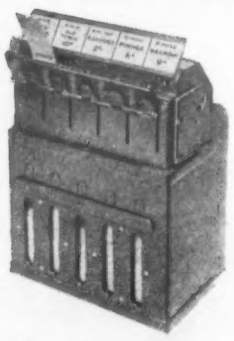

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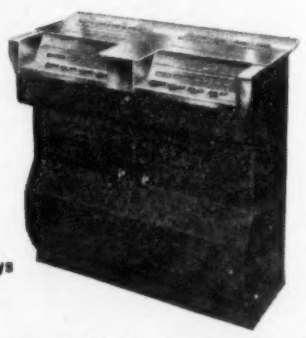

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SWEDISH STATE RAILWAYS

Competitive Commercial Policy

START OF CHEAP TICKET SCHEME

ONE of the most remarkable railway systems of Europe is that of the Swedish State Railways. It serves a country of 173,350 sq. miles, a size not always realised at home; it is, in fact, a country of such length that it is further from Malmö to the northern tip of Sweden than from Stockholm to Rome. Narvik on the northern coast of Norway is no less than 931 miles from Stockholm. Rivers and lakes occupy a good deal of the area and perhaps half is covered by forests. The northern part of the territory is a wilderness of forests, rivers and moorland; the fertile southern portion of the land lies substantially further north than Britain; Stockholm, the capital, is roughly in the latitude of the Shetland Islands. It is not surprising that the total population is under 7¼ million.

Railways for general commercial purposes, as a result of these geographical circumstances, came late to Sweden and, indeed, it is only two years since the centenary of the Swedish State Railways (Statens Järnvägar or SJ) was celebrated. The expansion of the railway network, in view of the sparse population, was truly remarkable from the time when Stockholm and Gothenburg — earlier linked by a canal of notable dimensions — were connected by rail in 1864. There are now 8,036 miles of 4 ft. 8½ in. railway, of which the majority—7,716 miles—is operated by the SJ system. There is a considerable mileage of narrow-gauge line, as might be expected, amounting to 1,783, out of which 276 is company worked. The gauge of these is generally 0.891 metre or 2 ft. 11 in., but 28 miles is on the 3 ft. 7 in. gauge and 223 miles is 3 ft. 6 in. gauge.

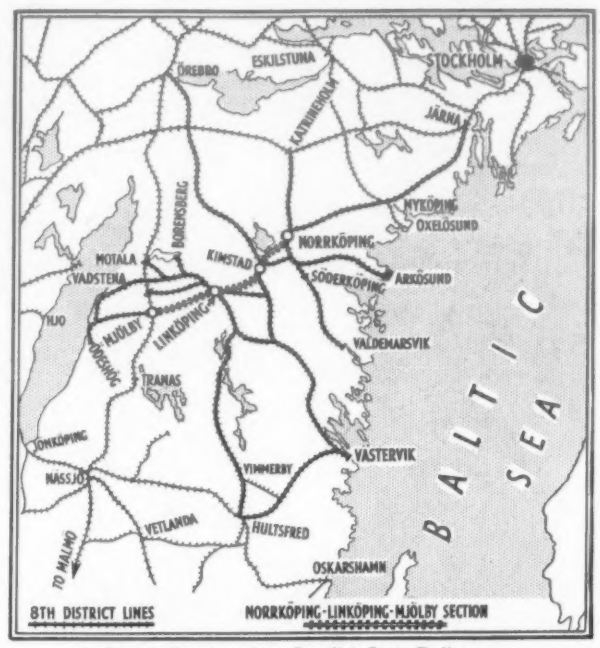
Electrification

Electric traction began tentatively in 1895, but the advantages on railways with heavy gradients in a country with abundant water power rapidly became apparent and for nearly 50 years the State system and the minor railways have pursued an active electrification policy as a result of which roughly 45 per cent of the system is equipped for electric traction and nearly 90 per cent of the traffic is handled by electric locomotives, railcars or multiple-unit trains. Electrification work is continuing; 167 miles were equipped in 1956-57 and a further programme of 109 route miles was then begun. The 15,000-volt 16⅔-cycle single-phase system is used. Other routes which because of light traffic do not justify the heavy capital expenditure of electrification have been turned over to diesel operation with locomotives, railcars and some interesting lightweight railcars or railbuses. Only 6 per cent of train-mileage was steam operated in 1957.

Although the SJ undertaking has been enabled by careful Government control of the situation to avoid violent road transport competition—indeed, there are some 2,200 buses working in close conjunction with the railways over 22,000 miles of route—it has not retained its pre-eminent position in Swedish transport without providing lavish facilities to attract public patronage. These paid off to the extent that until 1958 it was a profitable undertaking. Latterly, however, private transport has made considerable inroads into its prosperity. The operating ratio was 98 per cent in 1955 and reached 100 per cent in 1957.

Facilities Offered

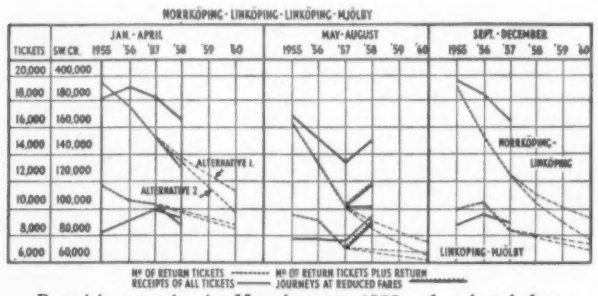
Among the notable facilities offered are generous suburban services; a systematic arrangement of connecting trains over the network with through carriages from Stockholm to 45 principal towns, covering the needs of nearly all, since two more out of the 53 important places are on narrow-gauge routes; fast trains over single-track routes, at bookings such as 62.8 m.p.h. between Stockholm and Gothenburg or 57.2 m.p.h. over the 372 miles from Malmö to Stockholm; reclining seats in second-class railcars for summer tourist traffic, with rugs available; a wonderful range of sleeping-car services in comparison with the population that attracted a million users out of the seven million inhabitants in 1955, with 24 inland services each night out of Stockholm (there are only 15 towns with more than 30,000 people and eight of those are so close to Stockholm that they do not need sleepers services); a very flexible meal service in restaurant cars that has been developed since 1894; and greater attention to comfort in rolling stock. Facilities for mothers with young children and night waiting rooms where waits between trains do not justify an hotel are among other unusual features which have built up very considerable goodwill.



The 8th District of the Swedish State Railways

Arresting Downward Trend

Nevertheless it is inescapable that traffic is on a downward curve. In February, 1957, Mr. E. G. J. Upmark, general manager of the Swedish Railways, decided that a trial of a new commercial policy was justifiable and that it should be conducted by the 8th district, centred on Norrköping. The object was to discover whether it was possible to stop the downward trend of railway passenger traffic over short distances where it was known that there was a heavy traffic by road. After discussion of several possible solutions to the problem the measures outlined below were embarked upon.



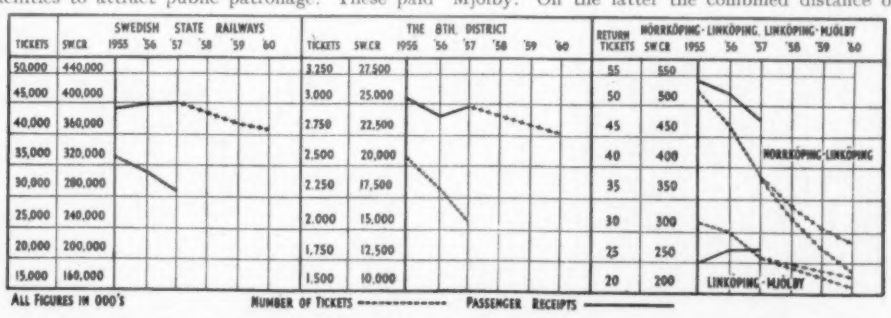
Promising results in May-August, 1958, of reduced fare scheme

Special tickets—"partibiljett"—valid for 10 single journeys in any direction were introduced at reduced fares between Norrköping and Linköping and also between Linköping and Mjölby. Inhabitants in Norrköping number 90,000, Linköping 62,000, and Mjölby 10,000. The distances are 46 km. from Norrköping to Linköping and 32 km. from Linköping to Mjölby. The tickets are *not* personal and several persons may travel together on the same ticket. The fare reduction for a second-class single journey is about 40 per cent and for a return journey it is about 20 per cent.

Additional Trains

Two new trains in each direction were put into service on weekdays between Norrköping and Linköping and one train from Mjölby to Linköping. For these new trains electric railcars are used and it has not involved any increase in the amount of rolling stock used. In addition to this, travellers between the towns mentioned do not have to hold the usual supplementary ticket for using some of the express trains. There are over a score of trains over the whole route and some extras on each portion. The newly available expresses are 0.600 hr. Norrköping to Linköping and 20.16 Norrköping to Mjölby. On the latter the combined distance of nearly 50 miles takes, with two stops, 65 min. The additional railcar services in this direction are at 8.50 and 16.35 from Norrköping to Linköping. Both the facility of riding without supplement on the expresses and the new railcars are provided right through from Mjölby to Norrköping in the other direction of travel.

The novelties were introduced at a press conference at the Governor's residence; there was an advertising campaign in the daily papers and folders were then distributed to every home in the towns concerned. Incidentally the line from Norrköping to Mjölby forms part of the shortened route from Stockholm to Malmö opened in 1874.



Traffic decline and its anticipated continuance on the Swedish State Railways, the 8th District and the sections with cheap ticket facilities

Results

And then what was the result? First, it must be said that the experience gained up to the time of the International Railway Congress in Madrid, where the district manager, Mr. K. F. W. Scherman, described the experiment, is not sufficient for a definite conclusion. During the first four months of 1958 the decline in comparison with 1957 was

(*Continued on page* 19)

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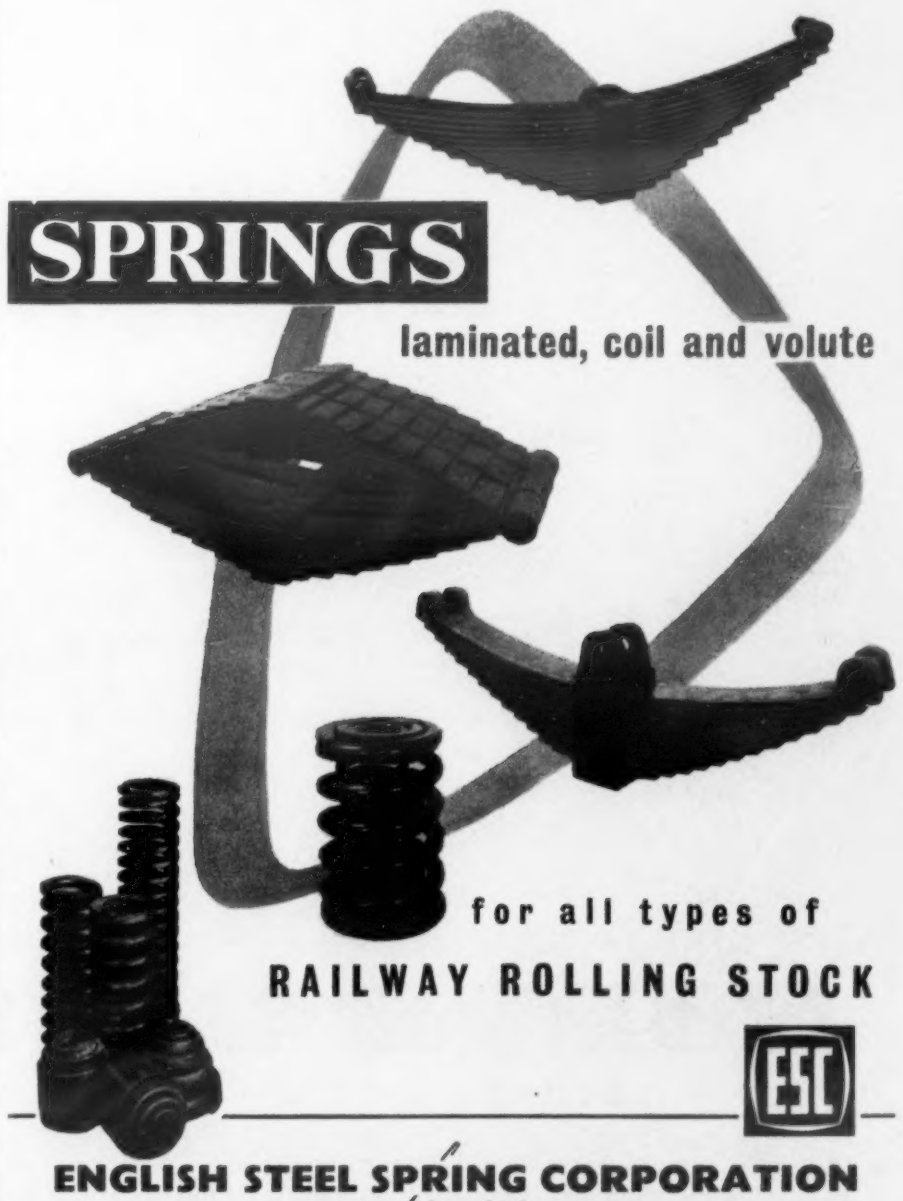

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TRANSPORT IN POLAND

Rolling Stock Manufacturing Industry

EXTENSIVE ELECTRIFICATION PLANNED

FIGURES issued in Warsaw during February by the Polish Ministry of Economics show that an iron and steel production last year barely up to the annual target resulted in certain branches of industrial production not only falling below the 1958 target but even dropping below production totals for the previous year. Particularly was this so in the field of transport vehicle manufacture. Railway passenger carriages reached, at an annual production total of 597, 99.5 per cent of the annual target for 1958 and totalled 103.8 per cent of the 1957 figure, while goods wagons—9,776 of which were turned out in Poland last year—reached a total amounting to only 81.5 per cent of the year's target and 81.9 per cent of the number produced in 1957. Steam locomotives attained, with a production figure of 68 for the year, 80.5 per cent of the 1958 target and as little as 64.6 per cent of the 1957 figure, though this fall over the year is said to have been anticipated. Very few locomotives at all will be produced in Poland this year.

Road goods vehicles, although their production reached 144.7 per cent of that for the previous year, still achieved—with only 11,507 units—only 96.2 per cent of the 1958 target. Ships, too, were a disappointment; the tonnage built over last year was 175,000 gross registered tons for ships of over 100 tons gross and was 95.9 per cent of the target. The figure is nonetheless 118.6 per cent the 1957 total.

Modernising Factories

Plans for the future are, however, rosy. The Economic Committee of the Polish Council of Ministers has decided upon investment of 2,000 million zlotys in the 1959-65 period in the works devoted to railway rolling stock construction. This sum is assigned for a considerable development of the factories; including equipment of new production shops, modernisation of production methods, and the like. It is mainly planned to develop such factories as Cegielski in Poznan, Fablok in Chrzanow and Pafawag in Wroclaw. Seven million roubles have been allocated for the purchase of imported machines and installations.

The following figures illustrate the projected expansion of the railway rolling stock industry: in the seven-year plan Polish State Railways will receive over 56,500 goods-wagons, over 2,400 passenger cars and some 300 electric locomotives. Considerable quantities of railway rolling stock will also be supplied to the mining and steel-making industries. One of the main items will be electric locomotives for collieries; more than 1,300 are included in the seven-year plan. Nearly 3,400 tank wagons and over 4,400 hopper wagons will also be produced.

Exports

Railway rolling stock is one of the main items in Polish exports. Its value is growing each year. Main customers are the U.S.S.R., China, Yugoslavia, Hungary, Czechoslovakia and the East German Republic. In the years 1959-65 Poland is expected to export over 2,500 passenger cars, 41,600 goods wagons and quantities of equipment for narrow-gauge railways.

Existing and proposed electrified railway routes in Poland

Electric traction has been employed for urban tramways in Poland for nearly 60 years, and it is 30 years since a standard-gauge main-line electric railway was opened between Warsaw and Grodzisk Mazowiecki. The construction of this first non-urban electric railway in Poland, carried out by a British firm, was the starting point for the introduction by Polish State Railways of a new traction system—applied first on suburban lines and later on main lines, and leading on towards the use of electric traction for the greater part of the ton-mileage generated by the railway, with the reduction of steam traction to a basic minimum.

Warsaw Suburban Electrification

As early as 1932, in view of the difficulty in coping with the growing suburban traffic in the Warsaw area, a project was drawn up for electrification of the suburban railway system. An agreement was made with British firms for the delivery of rolling stock, substation installations and distribution equipment. The agreement also provided for the carrying out on the spot by the suppliers of the greater part of the electrification works.

Four years later, the first 3,000-volt d.c. electrified section of the Warsaw system was opened—the Warsaw—Otwock route (23 km.), followed by the lines from Warsaw to Zyrardow (41 km.) and Minsk Mazowiecki (36 km.), i.e. those parts of the system carrying the heaviest passenger traffic. The total length of route electrified before the war in the Warsaw area was 112 km. A new connection across Central Warsaw was included. This electrification work was carried out on credit terms by British industry, English Electric Co., Limited, and the Metropolitan-Vickers Electrical Export Co., Limited, acting as joint contractors. British Insulated Cables carried out overhead equipment. The trams had Westinghouse brake gear. With the participation of a relatively small number of young Polish engineers the work was completed at the end of 1937, the first section having been opened on December 15, 1936.

Postwar Developments

All the electrified lines in Poland were completely destroyed during the 1939-45 war. The Warsaw system was devastated, and the Lower Silesian electrified lines had been dismantled. Without delay, in order to make possible the restoration of life in the ruined capital, work started on reconstruction of the prewar installations, and within a relatively short time electric traction was restored not only over the prewar sections, but also over new sections extending to Tluszcz and Blonie and later to Sochaczew.

In 1945 the first import agreements were made for delivery of two mobile substations and of equipment for a permanent substation in Brwinow. Fulfilment of these contracts allowed the opening of the following electrified sections: December, 1948—Warsaw East—Milosna; April, 1949—Milosna—Minsk Mazowiecki; June, 1949—Warsaw East—Warsaw Central; and January, 1950—Warsaw Central—Zyrardow.

In 1947 an agreement was signed for the supply of 3,000-volt substations, section cabins, three-car electric train units for suburban traffic, BoBo electric locomotives for passenger service and circuit breakers. In 1948 another agreement was made for provision of 800-volt substations (for electrification of the Gdansk—Gdynia region), electrical equipment for 3,000-volt three-car units, and electrical equipment for the 3,000-volt BoBo passenger locomotive.

In the first period of reconstruction and development of electric traction, aid was sought from Swedish and British industry, while at the same time projects and assembly work were the responsibility of Polish engineers. Some rolling stock was of Polish manufacture; but all electric equipment was imported. In this period an entirely new electric traction project was completed on the Gdansk—Sopot—Gdynia line, thus solving the internal communication problem of the "Triple-town." The railway repair works at Luban Slaski and Gdansk rebuilt war-damaged rolling stock and rebuilt German 800-volt stock for the requirements of traffic in the Gdansk—Sopot—Gdynia area.

The Warsaw—Gliwice Line

The next stage was that of providing an electrified Warsaw—Silesia line, since the existing line—the oldest in Poland—could not meet the demands imposed on it. This undertaking formed part of the main investments of the six-year plan on the part of Polish State Railways (1949-1955). Electrification of the Warsaw—Gliwice line, with a branch to Lódz, depended on the import of equipment from East Germany. At the same time, Polish industry was allotted an important role in the work, in the production of freight train motive power as well as electric units based on U.S.S.R. designs. Difficulties arose in this connection, owing to the country's lack of previous experience in the manufacture of electric locomotives, which caused delays in construction.

On the technical side there were two alternatives; either construction of a new direct line between Warsaw and Zawiercie, or reconstruction and electrification of the existing line, with the attendant problems of working on a line in operation. The second proposal was decided upon, as being economically better founded although more difficult. Work began at the end of 1952 and the following sections were in turn made available for exploitation: Zyrardów—Skierniewice, 1953; Skierniewice—Koluszki, 1954; Koluszki—Piotrkow, 1955; Piotrkow — Czestochowa, January, 1956; Czestochowa—Lazy, June, 1956; and Lazy—Gliwice, June, 1957.

Modernisation

It should be emphasised that the work was done with about 62 trains travelling on the line in each direction daily. Extensive rebuilding of stations was carried out at Skierniewice, Koluszki, Radomsko, Czestochowa, Zawiercie, Lazy, Zabkowice, Sosnowiec and Katowice. Investment included:

(1) modernisation of the line and stations and modernisation of safety equipment;
(2) work on foundations and piles, and erection of overhead lines;
(3) construction of substations;
(4) delivery of electric locomotives and three-car multiple-unit trains; and
(5) building up of a maintenance system.

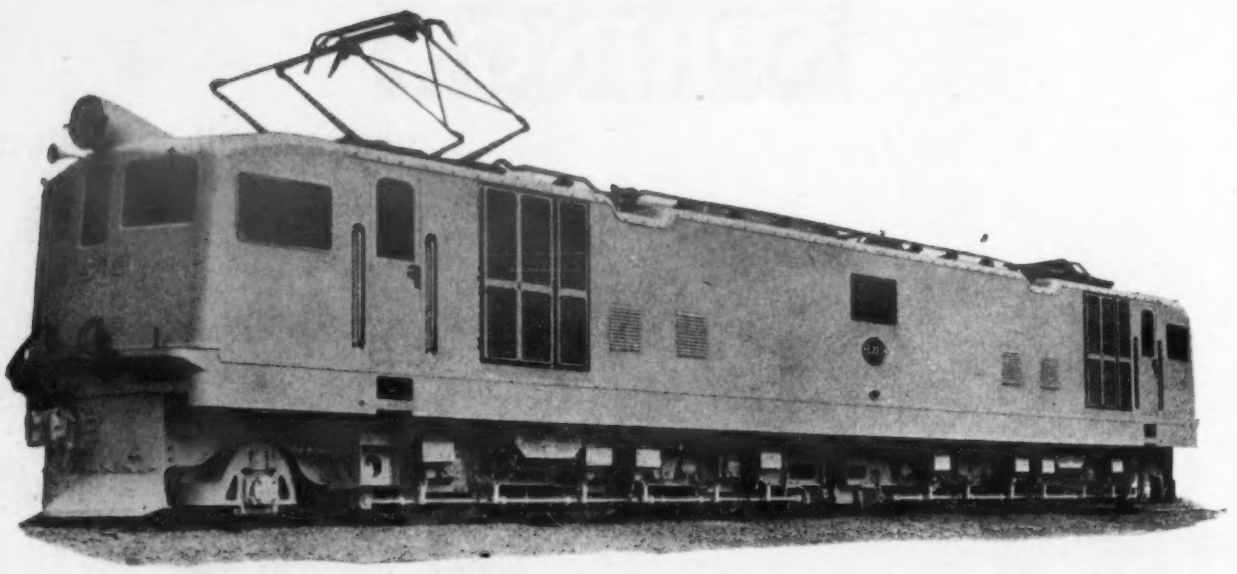
Modernisation consisted mainly in the adaptation of the line for heavy 150-axle trains, moving of tracks to allow erection of traction cables, and replacement of rails with a heavier type. The Warsaw—Gliwice line uses direct current at the Polish standard of 3,000 volts, and is supplied by 17 traction substations with a total transformer capacity of 120,000 kV. The traction substations are supplied from the power grid by 30,000-volt lines. About 1,000 km. of track are equipped.

Equipment for the traction substations on the line was imported from East Germany. Part of the equipment of the traction and supply systems is of Polish manufacture. Rolling stock used on the line is also imported from East Germany, while further deliveries of Polish-built rolling stock are anticipated for suburban transport in the Silesian system. The benefits include reduction of coal consumption by about 60 per cent; reduction of operating staff by about 25 per cent; and reduction of operation expenses by about 30 per cent.

Future Electrification

Analysis of economic data indicates that electrification of 6,700 km. (25-30 per cent) of the Polish State Railways system is appropriate. The carrying out of these plans depends essentially on the delivery of rolling stock and electric traction installations produced by Polish industry. Within the next planning period only part of the electrical equipment for traction substations will be imported. A natural consequence of the plan is the decision to discontinue purchases of steam locomotives. Delays in domestic production have to some extent held up realisation of electrification

(*Continued on page* 14)



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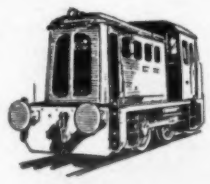

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THE RURAL BUS IN SPAIN

Evolution of Unusual Double-Deck Design

TOURIST COACH FACILITIES

THE notoriety of the allegedly bad roads in the country districts of Spain has probably persisted among the English as a result of the tales told of them during the Napoleonic wars. Upon what veterans of the Peninsular campaign had to say over a century ago modern motorists' legends have been grafted. In actual fact, the main roads are today of a reasonable, if not lavish, standard, although always liable to a sudden burst of potholes on the grand scale—which drivers avoid with alarming swerves—or to the undulations and upsets caused by major reconstruction under the modernisation schemes now proceeding. Severe storms also take their toll of the top surfaces, but in recent construction tarmac or bitumen on a good thick foundation is the order of the day. In 2,000 miles of recent journeyings, including many mountain roads on the south side of the Pyrenees, although it cannot be denied some bad stretches were encountered, nothing so formidable was struck as has to be endured on some of the worst main roads of the crofter counties of Scotland.

An ancient 26-seat bus with Hispanola engine, owned by Montserrat Omnibus Company of Tarragona on the service to Catillar, with rudimentary seating on the roof; by contrast, a Leyland coach with Alberola bodywork, operated by La Union S.A. on the thrice daily Valencia—Alicante service which takes 4½ hr. for 115 miles

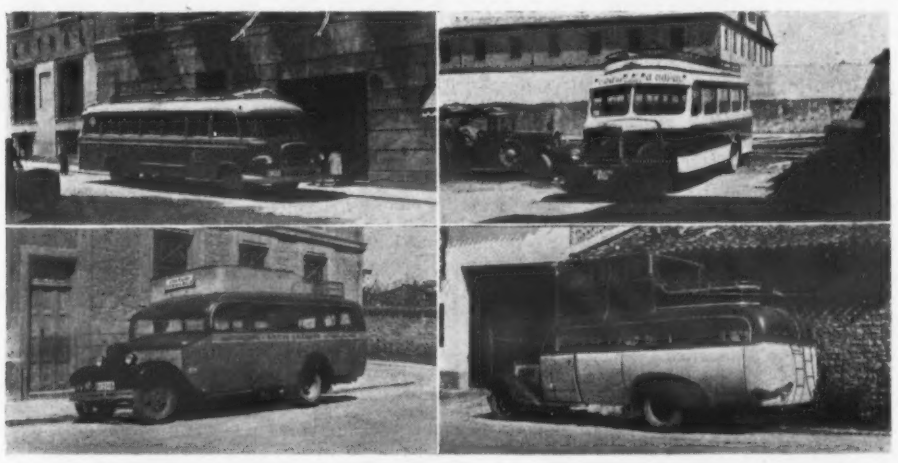
Highway Engineering

In the broken terrain geological changes have produced over so much of Spain some of the road engineering is of a high order. Roads wind up (or down as the case may be) through 10 hairpins and two sharp bends with nonchalant ease, only to repeat the performance a few miles farther on or to turn aside to trace their way across a deep river gorge at the most convenient point. Nor are all the engineering features modern. The great stone bridge across the Tajo at Alcantara is a viaduct of impressive proportions made of cyclopean stone blocks centuries ago. The road is carried above the water at a level 60 ft. above that of the railway track across the Forth Bridge; St. Paul's dome could almost be accommodated in the span of each of the principal arches.

With a population of 28 million spread thin over 193,000 sq. miles, or round about twice the size of Great Britain and, as has been indicated, an adequate although not very extensive road network, it is not surprising to find that the country has been gradually recognised as ideal territory for motor bus operation, which is, indeed, of respectable antiquity. In the great cities the British type of double-decker has made its impact with satisfaction—Barcelona had open-top Tilling-Stevens petrol-electrics over 30 years ago and at present the town has a large postwar A.E.C. fleet, with locally built double-deck bodies, while Madrid has also favoured British products and recently expanded its stock of Leyland Titan double-deckers with a fleet having M.C.W. bodywork and modern bonnets. In their blue livery these are among the smartest vehicles in Spain.

Native Art

In this sort of city bus fleet construction the British have no rivals in Europe. The Spaniards' talent in production of coachwork is usually for one-off jobs that do not have to be repeated, although if need be he can become a clever copyist, as was demonstrated in the works of a small coach and lorry operator during the 1957 visit of the Institute of Transport congress to Barcelona. Some elegant coach bodies are to be seen in various parts of the country, the one operated around Barcelona with an elevated driving position evolved by Senor Gelabert being an example of high-quality workmanship and of designing skill of no mean order. The use of a thin windscreen pillar to house the controls between the driving position and the chassis, which was a Federal lorry of 1938 converted to a rear engine vehicle, showed exceptional talent, probably above that exhibited in the Zürich city bus with the driver carried in the front canopy.



Evolution of roof seating: Luggage on bus owned by Automoviles Aventin on the service from Graus to Monzon; Perkins-engined vehicle with streamlined luggage rack on Estella—Napal service; below, roof accommodation with windbreak on Chevrolet plying between Vitoria and Colegio Vera-Cruz for Autobuses Lucio Uriarte; and, right, La Saberaterra at Salvatiera, a Federal chassis on which the roof seats are afforded an open canopy

Bus stations at Pamplona and Barbastro; below, Bedford bus on town service in Vitoria, shared with a Perkins-engined Seddon; and right, a Mercedes-Benz on local operation by Automoviles y Transportes, S.A., in Lerida

While many Spanish operators are content with ordinary vehicles others have assisted in the development of a fresh outlook on coachwork design which has evolved from early single-deckers. Like the origin of the London double-decker in the traffic peaks of the Great Exhibition of 1851, these rural semi-double-deck buses in Spain were produced to meet exceptional traffic demands, the earliest we have traced having a garden seat for

(Continued on page 35)

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LETTERS TO THE EDITOR

Timetable Clarity

SIR,—Standard hieroglyphics are not needed in timetables. These signs should be replaced by plain English when important, and eliminated if useless. Last summer the Western Region showed:

G arrives 3 min. earlier. Is punctuality so exact?
H station for Donnington. Who cares? The index says "see Speen" but no table. Why not say "Donnington, use Speen . . . 65"?
* 81¼ miles via Fordingbridge. So what?

The L.B.S.C. was notorious for this kind of thing, but it has almost vanished from that line, with no ill-effect. Public timetables need drastic overhaul and meaningless comment deleted, e.g.:

Aylesbury line: Marylebone 10 p.m. "via Harrow to Manchester." Manchester passengers will use another table, and the train does not stop at Harrow.

Stations are inserted at which the trains never stop, and the tables are filled with optimistic connections, but it is often impossible from timetables on sale to find on *one* table where the train does stop, say between Euston and Glasgow, or Paddington and Penzance via Bristol. I defy anyone to find out easily from these tables if any trains from (*a*) Chippenham call at Newton Abbot, (*b*) Crewe call at Kirkham and (*c*) Kenton call at Camden Road.—Yours faithfully,

F. A. RULER.

48 *The Knoll, Hayes, Bromley, Kent.*

SIR,—Jumbo (January 31) and Mumbo (February 28), show by their pleading for 24-hour clocks and standardised signs that the Island race is indeed weakening and the country rapidly going to the dogs. Obviously they are unaware that two senior clerks are permanently employed in changing round all the references between successive issues of the timetables, so as to keep the reader on his toes. For the same reason 20.00 may be written 8.0 (p.m.), 8p.0, 8.0p, 8/0 and 8.00 (as opposed to 8.00 which is 08.00). There is even heavy and light type for the same purpose.

No, sir. If Liverpool Street and Victoria (not to mention Dorland Hall and Airways Terminal) are to be allowed to invade Euston and Paddington, let's do the job properly and make as many of the signs as self-explanatory as possible. What is wrong with the bed for a sleeper, a knife and fork for RC, a wine glass (we're getting gayer now) for a RB (or BC?), and, as a ray of light in an otherwise dismal prospect a white glass on a black background for what the French call so aptly a "vente ambulante de consommations" which sounds so much more exciting than "refreshment trolley service." A picture of a coach means, believe it or not, a through coach, and one of a bus means a bus connection.

Incidentally, ‡ is clad only in Midland red. Out of Waterloo it becomes U, and Kings X is fancy free and may use any letter. The answer to the two trains leaving at the same time is of course that one ought to be No. 124—the other No. 71. Just like auntie who sends a postcard from Cardiff saying "I'm coming on the 1 o'clock." It is only after searching all round the station for her that you realise she meant the train leaving Cardiff about one o'clock and not the one arriving in Birmingham from Cardiff about one o'clock. Or the unfortunate foreigner who was visiting friends in Rugby on his way to Ireland. His sleeping-berth ticket showed the train as the "8.45 p.m.," so he duly made his way to the station at that hour, only to find that it left Euston at that time and "8.45" was the "title" of the train, not the time it left the station from which his sleeper was booked. An oversight, but an annoying one. No single item would make for clarity so much as universal train numbering (which GN and NE already do) and *publication* of these in the ordinary public timetables. Like this there might be a little less Mumbo-Jumbo. If people don't like asking foreigners how to do the job, there is no need. B.E.A. would be pleased to explain!—Yours faithfully,

"ORARIO."

The White Paper on Canals

SIR,—You refer in your issue of February 28 to the B.T.C.'s plans to concentrate on improving its wide canals and then criticise the Weaver—Wolverhampton proposal. The Shropshire Union Canal was constructed late in the canal-building era. It was conceived on a grander scale following a direct rather than a contour route with improved section and depth. It should therefore be capable of improvement to barge standards at minimum cost, and coupled to the Weaver would project barges right into the Black Country. As long ago as 1943 the Severn Commission was pressing for the Stourport—Wolverhampton link to be made a barge route. The Grand Union Canal has wide locks throughout from London to Birmingham and the proposal to make it available to wide boats should be supported. The Birmingham and Wolverhampton levels of the B.C.N. are extensive and the links with north-west, south-west and London would carry barges right to the heavy traders' doorsteps. You have always supported the view that the trader has the right to choose the form of transport he prefers, and you advocate free competition between these forms. It is surprising therefore that you should appear to suggest that Government proposals to modernise rail or roadway should rule out modernising other forms on the same route.

We hear a lot about the waterways being extensions of the ports for "over the side" loading and unloading, and of improving the wide canals, but this does not appear to have been the policy since the 1948 Act. Rochdale, Barnsley, Dearne and Dove, Derby, Stroudwater, and Kennet and Avon have all been allowed to become useless. All are wide canals and the first four at least link industrial towns of importance with the ports. Apart from short lengths built to serve industries now decayed no narrow canal has been abandoned in the same period. Added to all this is the rumour that the Forth and Clyde Canal, which has the largest section and depth of all British canals (excepting ship canals), is to be abandoned. Is Glasgow to be classed as a decayed industrial centre and port?—Yours faithfully,

R. G. R. CALVERT.

45 *Woodwaye, Watford, Herts.*

The Editor is always glad to receive letters from readers on subjects germane to the transport industry, but these should be written as concisely as possible. The opinions expressed therein must not, however, be regarded as having editorial endorsement. Where correspondents desire to use a nom-de-plume it is essential that the Editor should be informed of the name and full address of the writer as indication of good faith.

★

TRANSPORT IN POLAND

(*Continued from page* 12)

plans, and in order to minimise the effects of these allowance has been made for a certain amount of imports, on condition that there should be a comparable expansion of trade with the countries in question in order to cover the import costs. To this end there have, for example, been negotiations with Swedish industry, and at the same time Poland is seeking a licence for production of modern electric rolling stock.

Naturally the tempo of electrification and turnover to diesels depends on the production possibilities of Polish industry, on the supply of electric power available, on the linking of electrification with essential modernisation, on the guaranteeing of supplies of materials, and on the training of specialists. A long-term plan based on the foregoing, has already been drawn up in draft form. The first results of this draft indicate the need and the possibility of fixing a tempo of electrification at about 250-270 km. of line a year, i.e. up to 1975—5,128 km., or 22 per cent of the total length of Polish State Railways lines, giving 61 per cent of the traffic on Polish State Railways. We are indebted for much of the foregoing information to an article by Ing. W. Dowiatt, in *Przeglad Techniczny*.

After overcoming inevitable teething troubles, it is thought that the electrification of Polish railways will proceed increasingly smoothly, and that the full realisation of the long-term plan for electrification will be completed from the country's own industrial and manpower resources.

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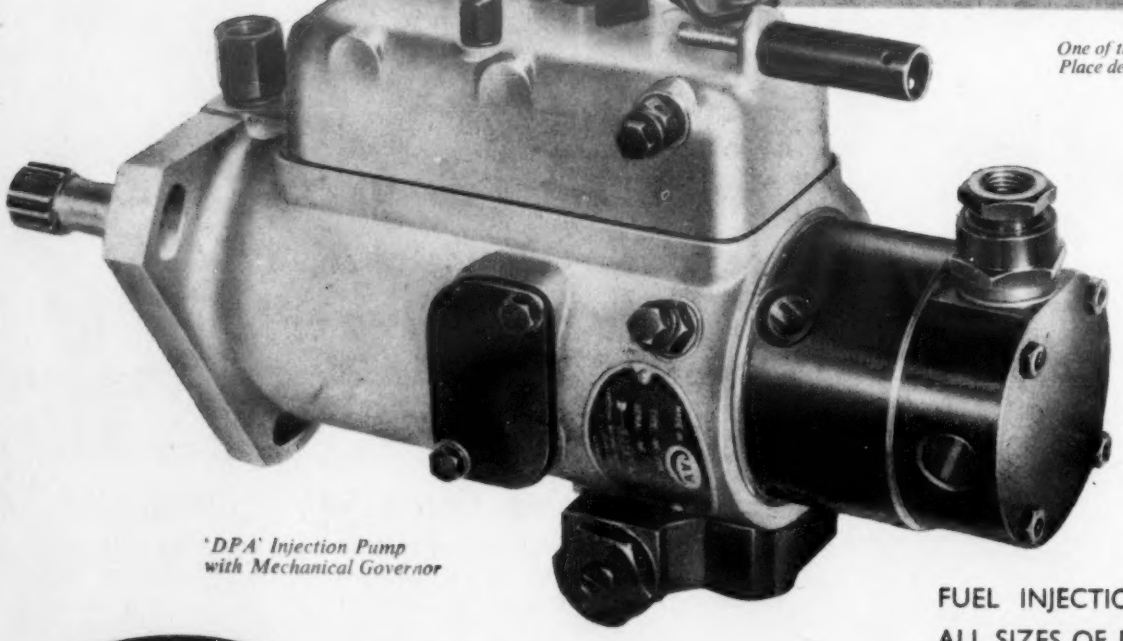
One of the Marly Horses, Place de la Concorde, Paris



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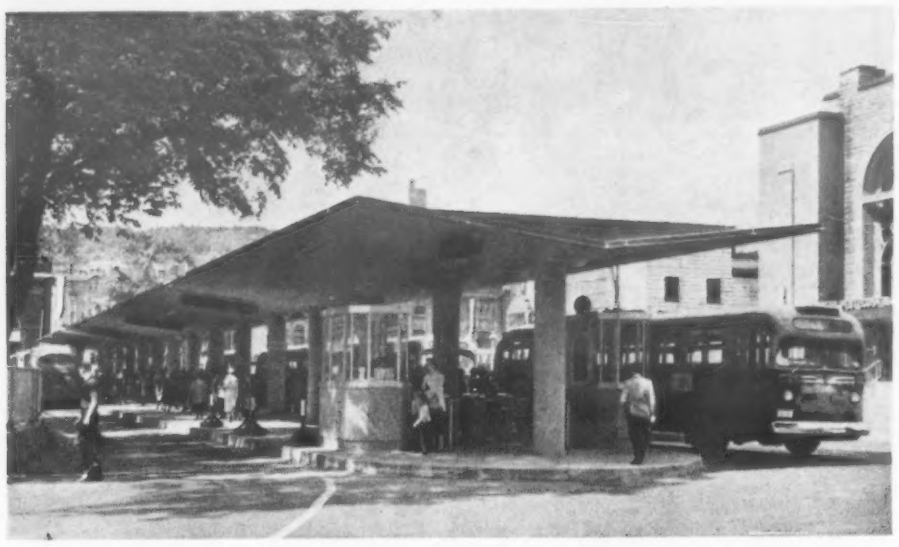
MONTREAL TRANSPORT

Comprehensive Modernisation Programme

A veteran Leyland Lioness now used by the M.T.C. ex-servicemen's branch

MONTREAL and the surrounding municipalities form Canada's largest city, situated on the Island of Montreal, with Mount Royal rising from the business area. The road passenger transport system is operated by the Montreal Transportation Commission, serving an area of 91 square miles with a population of 1,475,000. In 1951 the M.T.C. took over the private Montreal Tramways Company which had long served the area primarily with tramways.

That company had first brought two buses into use in 1919, but up until 1944 a total of only 493 buses had been purchased, all in small lots and from a great variety of manufacturers, primarily American with some British chassis with Canadian bodywork. Most of these units had petrol engines, although in 1927 Versare supplied six petrol-electric buses. One of these was an incredible vehicle with aluminium body mounted on two steered motor-driven bogies.



Part of Atwater terminus with a 1956 model 45-seat General Motors bus on the right and in the left background a 38-seat Cancar delivered in 1955

Decision to Replace Trams

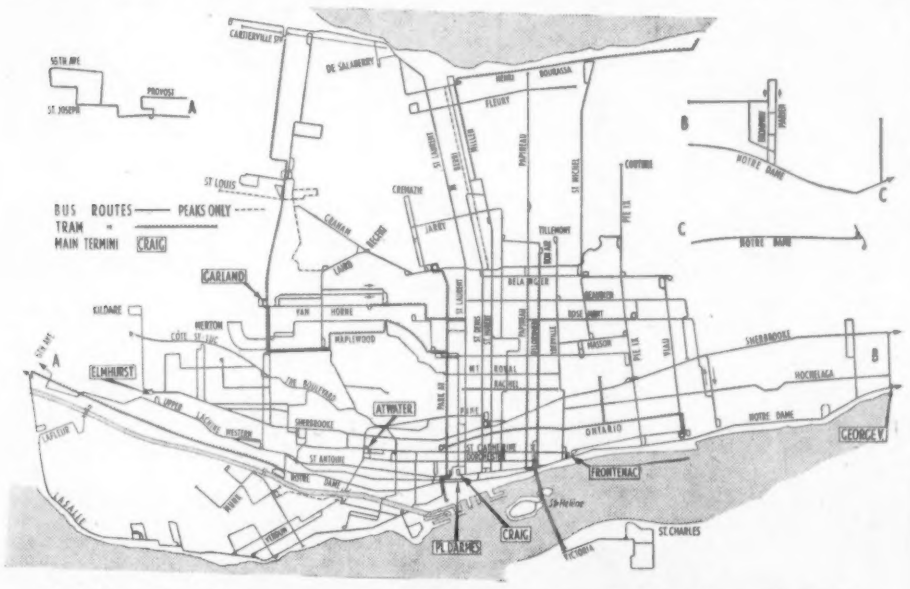
In 1945 the company was faced with the necessity of modernising its services and the needs of the area were re-examined. Although some trolleybus lines had been started in 1937 and 18 P.C.C. tramcars purchased in 1944, it was decided now to concentrate on bus operation to ease traffic problems, and provide flexibility to serve the expanding Montreal area. From then until 1951, 350 buses were ordered, 315 from Canadian Car. At this point the M.T.C. was formed and undertook a complete conversion programme. In the next seven years 930 more buses were purchased, 675 from Canadian Car, 180 from Mack and 75 from General Motors. In 1957 the Commission issued the largest bus order placed in Canada when a further 325 buses were ordered from Canadian Car for $8 million. These were for delivery during 1958 and brought the total vehicles operated to nearly 2,000; the tramways have been almost completely withdrawn. The 105 trolleybuses continue in service. Between 1951 and 1957 the M.T.C. reduced tramcars from 939 to 314, and the mileage operated by them from 57 per cent of the total to 23 per cent, while bus mileage increased from 37 to 71 per cent, and trolleybuses have remained at 6 per cent. Vehicle mileage totalled 49 million in 1957, maintained over more than 100 routes.

Parallel with this replacement of rolling stock, new garages and bus stations for route interchange have been built and other garages enlarged. The Cremazie repair shops have been expanded to a floor area of 186,000 sq. ft. to maintain a fleet of 2,100 vehicles, including complete overhaul and rebuilding of bodies and engines.

More Tram Replacement

The accompanying map shows the bus and tram services as they were prior to the carrying out of the 1958 tramway replacement programme. This was achieved in two main stages and involved abandonment of 10 tramway routes together with the isolated Lachine service which ran roughly parallel to the Lachine Canal. The Montreal city authorities needed the land occupied by its reserved tracks for construction of a new main sewer and, therefore, provided a new road to be used temporarily by the replacing bus route. With the abandonment of the other routes there remained in the western half of the city only the suburban tram route 17 between Garland and Cartierville and, in the eastern half the north-south routes on Papineau and Delorimier and the eastward branch from the former along Rosemont. Inner sections of these routes and also that to Lachine were replaced by buses in June, 1957. Other tram routes still awaiting replacement are two suburban routes on the north of the main island.

The Commission believes that Montreal's primary demand is for mass transport by frequent and fast service, made more difficult in winter by an average annual snowfall of 110 in. Thus, emphasis is placed on buses with a high loading capacity and in peak periods often 50 per cent of passengers are carried standing. Approximately 100,000 passengers are moved to or from the concentrated central district in the peak hour, and the trunk routes handle this with a service headway of 45 seconds. All buses are one-man operated, zone fares and transfers apply, with extra charges for the popular express services, and for the outer urban areas. Some routes operate on a 24-hour basis, others for 20 or 22 hours. In 1957 there were 293 million originating passenger journeys, a drop of only 0.9 per cent on 1956; in addition, 135 million transfers were issued. The revenue deficit was only 1 per cent of expenses.



Trolleybus, bus and tram routes of the Montreal Transportation Commission prior to the 1958 tramway replacement programme

Underground Project

Experience has proved that the tram substitution programme has resulted in an acceleration of up to 10 per cent in the traffic flow on the more congested streets, but it is not for one moment pretended that use of buses is the complete answer to the peak-hour problem. The proposals for an underground railway system have been in existence for some years and have already been described in MODERN TRANSPORT, but financing of the work remains a considerable problem. It is proposed that the first line should commence on St. Denis Street, north of Cremazie Boulevard, follow St. Denis south to its junction with Craig Street and then turn west along Craig, diagonally under Champ-de-Mars, on via St. James Street, Inspector Street, Dominion Square and St. Catherine Street to Atwater.

The latest order of buses are designed and built by Canadian Car Company, meeting M.T.C. specifications, and are a modified form of its CD-52 T.C. coach. They have 45 seats, and a further 40 standing passengers may easily be accommodated. The bus has an overall length of 39 ft. 10⅛ in., width of 8 ft. 6 in. and a height of 9 ft. 11⅞ in. The unladen weight fuelled is 19,900 lb.

(To be continued)

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1919 1959

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SEA LINKS WITH THE CONTINENT

*19—Facilities Through Harwich (Cont.)**

THE train ferry facilities do not, by any means, conclude the facilities that are available through Harwich. There is also, for example, among the special freight facilities the container service. British Railways containers of various types are available for shipment by the steamer services for the conveyance of merchandise to or from most European countries. They, of course, afford a door-to-door service and their use is economical by virtue of packing being reduced to a minimum or eliminated. It minimises handling and reduces the risk of loss, damage or breakage. Containers are particularly suitable for household removals when British Railways will arrange the whole transit from house to house including packing and unpacking.

To meet constantly increasing demands, various types of containers have been introduced which are available for the conveyance of practically all descriptions of merchandise in loads of from 1 to 4 tons per container. Types A and B are covered and are specially suitable for goods needing complete protection; whilst the C and D types are open at the top, and are intended primarily for heavier traffics not requiring complete protection. Type H has been specially designed for bricks, tiles, slates, stonework, etc. Type FM is an insulated container mainly designed for frozen meat and other frozen products and Type AF is a highly insulated container specially designed for quick-frozen and deep-frozen traffic. Some specimen types and dimensions are set out in an accompanying table. A special pamphlet on the subject is available.

CONTAINER TYPES

Types		*Interior dimensions*			*Capacity (approx.)*	*Load (max.)†*	*Tare Weight*
		Length	*Width*	*Height*			
		Ft. in.	*Ft. in.*	*Ft. in.*	*Cu. ft.*	*Ton*	*Ton cwt.*
Covered—A	..	7 4	6 7½	7 1½	329	3	1 3
B	..	15 8	6 7½	7 1½	717	4	2 –
AF	..	5 11	5 5	6 3	193	3	1 15
FM	..	14 0	6 0	7 1	600	4	2 2
Open — C	..	7 3	6 0½	2 10½	125	3	– 14
D	..	13 9½	6 0½	3 7	298	4	1 1
H*	..	6 9	3 9	1 9½	46	2½	4 10

†Subject to gross lifting capacity at port concerned.
*For bricks, slates, tiles, etc.

Through Consigning

Facilities are available under international regulations (C.I.M.) for the through consigning of traffic from any station in Great Britain to most stations on the Continent and vice versa, under one set of transport conditions, with the advantage of enabling merchandise to be consigned with carriage charges payable by sender or consignee.

Special facilities exist under international express parcels tariffs for conveyance at through rates between stations in Great Britain and certain stations in Austria, Belgium, France, Germany, Italy, Netherlands, Scandinavia, Switzerland and Eastern European countries (except U.S.S.R.) via British Railways steamship routes. Parcels by passenger train service can also be forwarded at through rates between London or certain provincial stations in Great Britain and the Continental ports and parcels can also be accepted for forwarding from London (Liverpool Street) via Harwich (Parkeston Quay) and Esbjerg for any postal destination in Denmark, Sweden or Norway.

Cars

Accompanied cars, motor-cycles, caravans and baggage trailers are conveyed on the passenger steamers. A special booklet entitled "Sea Ferry Services" is issued for the benefit of motorists; this gives details about all types of vehicle and shipping arrangements. In addition to customs formalities British Railways is prepared to effect comprehensive insurance on merchandise and livestock by all services from sending point in Great Britain to destination on the Continent and vice versa.

Rates and other information can be obtained from the appropriate British Railways district office or any station, or from :

Continental Traffic and Shipping Manager, British Railways, Eastern Region, Harwich House, 129 Bishopsgate, London, E.C.2, or from
Shipping Manager and Port Superintendent, British Railways, Parkeston Quay, Essex,

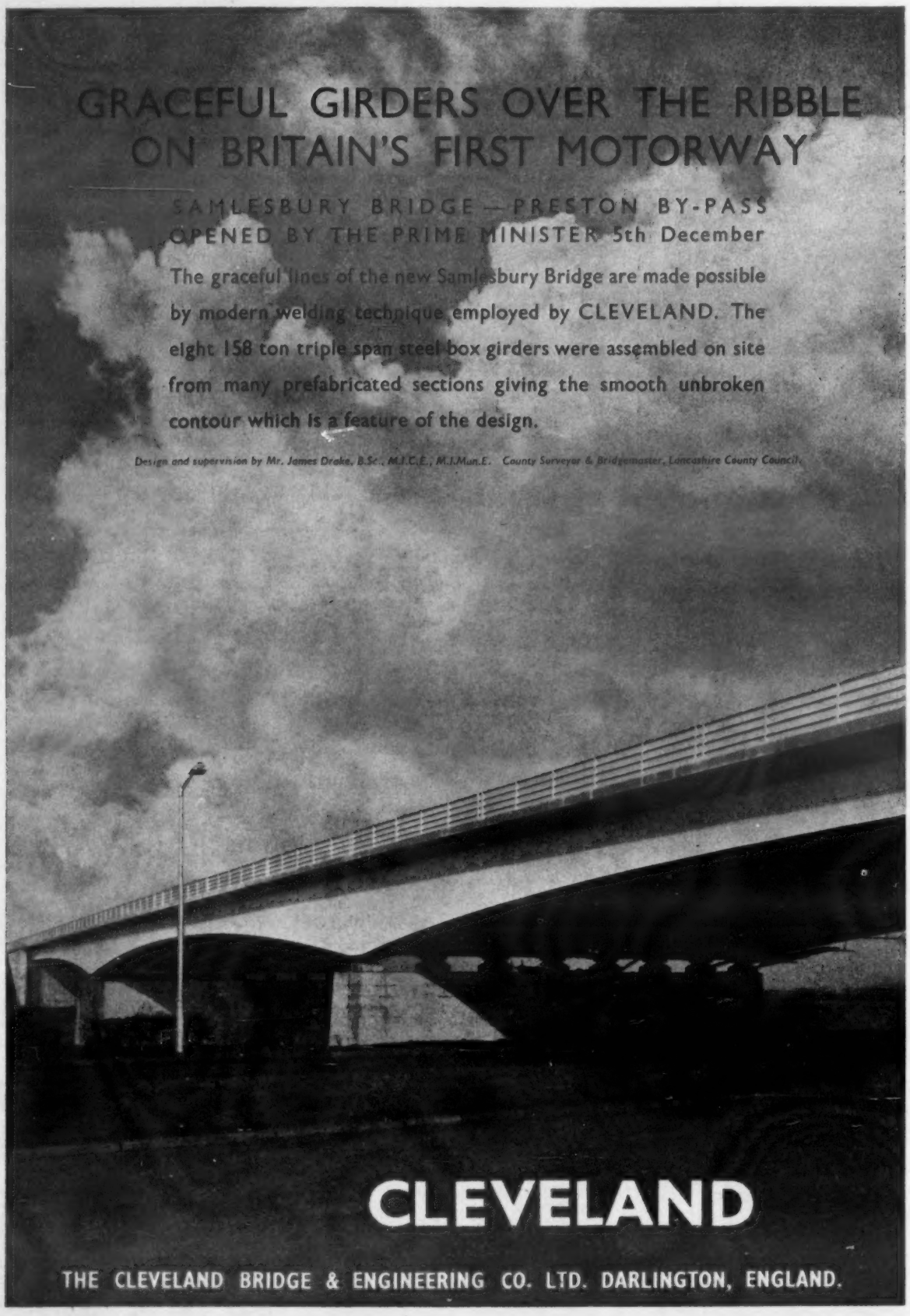
in connection with sailings to Antwerp, Hook of Holland (night service), Rotterdam and Zeebrugge. For the Zeeland Steamship Company Harwich—Hook of Holland day service the London agent is W. H. Müller and Co., Limited, Customs House and Wool Quays, Lower Thames Street, London, E.C.3, and Greener House, 66-68 Haymarket, London, S.W.1. For United Steamship Company (of Copenhagen), working the Harwich—Esbjerg service, United Shipping Co., Limited, 108 Fenchurch Street, London, E.C.3, acts as London agent.

On the Continent further information can be obtained from :

ANTWERP—Westcott and Co., Quai d'Herbouville, H.9.
BASEL—General Agent, British Railways, Centralbahnplatz, 9.
BRUSSELS—General Agent, British Railways, 41 Boulevard Adolphe Max.
COLOGNE—General Agent for Western Germany, Av. den Dominikanern, 9.
HOOK OF HOLLAND—Hudig and Pieters, Station Buildings—for Night Service. Zeeland Steamship Co., Harwich Kade—for Day Service.
PARIS—General Agent, British Railways, 12 Boulevard de la Madeleine.
ROME—General Agent, British Railways, Via Torino, 40.
ROTTERDAM—Hudig and Pieters, Calandstraat 49/51.
ZEEBRUGGE—La Société Belgo-Anglaise des Ferry-Boats, Zeebrugge.

It must surely be appropriate to conclude this review by recalling that, day and night, for passenger or freight, the facilities embodied in the slogan "The Continent via Harwich" continue traditions of nearly 300 years.

* No. 18 appeared February 28.


GRACEFUL GIRDERS OVER THE RIBBLE
ON BRITAIN'S FIRST MOTORWAY
SAMLESBURY BRIDGE — PRESTON BY-PASS
OPENED BY THE PRIME MINISTER 5th December
The graceful lines of the new Samlesbury Bridge are made possible by modern welding technique employed by CLEVELAND. The eight 158 ton triple span steel box girders were assembled on site from many prefabricated sections giving the smooth unbroken contour which is a feature of the design.
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As recorded in our issues of February 28 and March 14, agreement has been reached on the financing of the Tyne vehicle tunnel and a proposed scale of tolls has been recommended

MODERN AIRWAYS and COMMERCIAL AVIATION SECTION

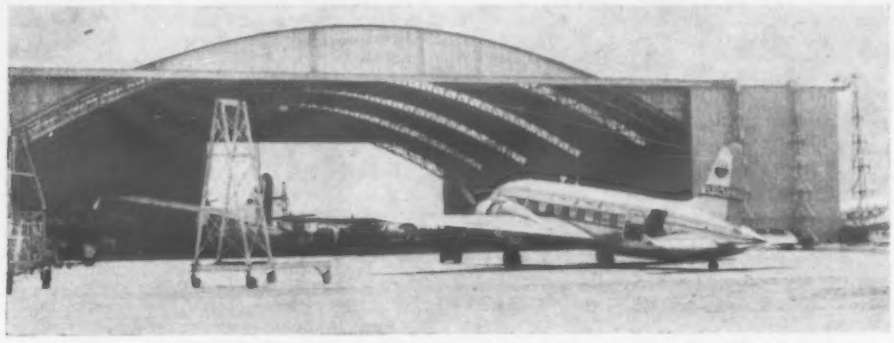
OPENING UP AFRICA

*Development of Central African Airways (Cont.)**

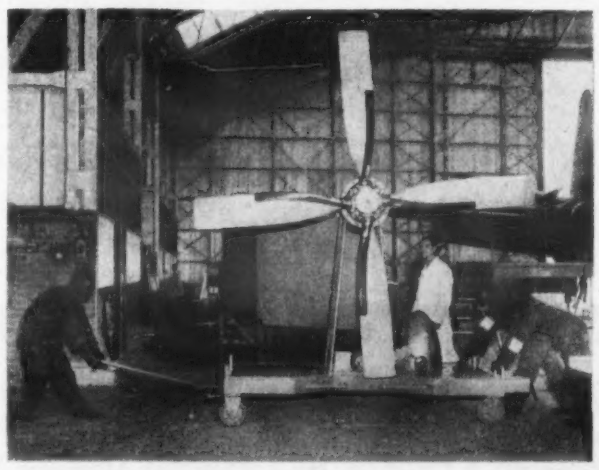
ADMINISTRATION AND ENGINEERING

OTHER shorter external links flown by Central African Airways are a weekly service from Salisbury to Beira, thus harking back to the days of R.A.N.A., and a weekly extension of the Salisbury—Ndola service to Elisabethville in the Belgian Congo.

On trunk services it has been the policy to provide two types of operation. One is the colonial coach service between Salisbury and London known as the Zambesi service and initiated with Viking aircraft. Following the delivery of the Vickers Viscounts, a parallel operation was begun with the new machines which eliminated night stops, operated at ordinary tourist fares and was co-ordinated with the Springbok services of B.O.A.C. and South African Airways. For various reasons this arrangement did not work out altogether satisfactorily and under an agreement reached in 1957 with B.O.A.C. the tourist class services were maintained with Argonauts taken over from the corporation while Viscounts took the place of the Vikings on the Zambesi service to balance a similar change in equipment made by Hunting-Clan Air Transport and Airwork on their joint Safari service to Salisbury. The Zambesi service is operated weekly and the Argonauts have been replaced by a weekly service provided by a B.O.A.C. Bristol Britannia operating on charter and having first-class and tourist accommodation.



The large maintenance hangar of Central African Airways at Salisbury Airport which was originally the Theatre Royal at Bulawayo. The Vickers Vikings have since been withdrawn from service



Removing a propeller from a C.A.A. Viscount to the propeller shop

Before turning to other aspects of C.A.A. operation it is appropriate to bring up to date circumstances related in the previous article. The Vikings have now been withdrawn from service and the fleet now comprises Vickers Viscount, Douglas DC3 and de Havilland Beaver aircraft. Opening in January last of the new airport at Bulawayo made it possible to use Viscounts there and the Johannesburg service shared with South African Airways is now maintained by both operators with that type of aircraft. There has been some expansion of Beaver operations in Northern Rhodesia and Nyasaland, but the Southern Rhodesian operations between Bulawayo, Salisbury and Umtali via intermediate points have been relinquished in favour of Commercial Air Services. The main Salisbury—Bulawayo service is now provided in the main by Viscounts although there are still some DC3 operations.

Administrative Headquarters

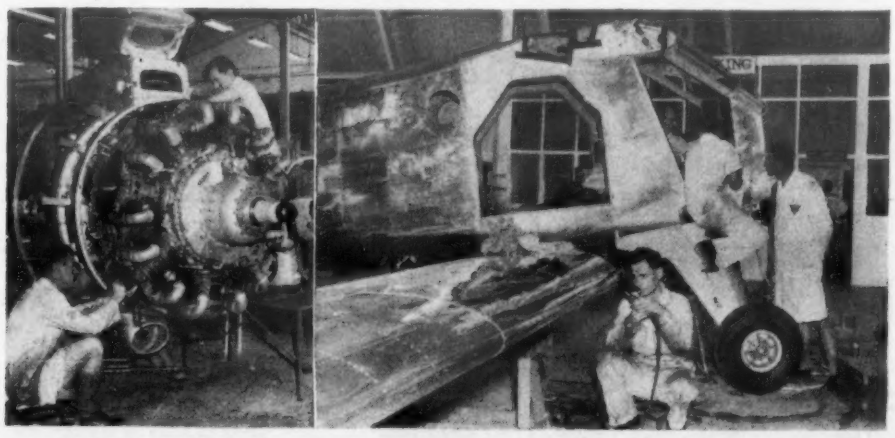
The administration of Central African Airways has benefited greatly from the provision of its new headquarters at Salisbury. When it was at Belvedere, the old airport, its various divisions were scattered round the circumference of the airfield in erstwhile Service buildings which afforded an admirable example of dispersal required by the circumstances of war but which were a definite drawback to the maintenance of departmental liaison. The new administrative block consists of three long single-storey sections linked by a central passageway and with a clubroom and canteen behind and at right angles to them. West of them lies the large workshop and stores block and west of that again is situated the big maintenance hangar.

The engineering side of the airline had been at as big a disadvantage as the administration while it was at Belvedere. The engine repair and propeller shops were all of half a mile from the maintenance section and the stores and spares were in an adapted hangar which was, to say the least, barely suitable and also hard to keep weather-proof. The whole of the engineering division is linked by a wide passageway from the entrance on the east side of the workshops right through to the maintenance hangar so that material and equipment can be moved under cover—there is a second covered way to the hangar from the western side of the stores, also with this aim in mind.

The actual workshops occupy the eastern side of the workshop and stores block, with the latter section conveniently placed between the shops and the hangar. It is thus a simple matter to feed stores in either direction according to requirements. The principal shops are the instrument, electrical, upholstery, sheet metal, paint, machine, process and propeller. There are engine assembly bays for the Rolls-Royce Darts from the Viscounts and, until recently, the Bristol Hercules engines from the Vikings, and there are also power plant and airframe power plant accessory bays, test rigs and a battery maintenance and charging room. The workshops occupy an area of some 200 by 300 ft., while the floor area of the stores is 200 by 225 ft. The layout of the latter accords with modern practice and it is probably unnecessary to add that particular attention has been paid in all the new buildings to the provision of adequate ventilation, an important feature despite the altitude of Salisbury.

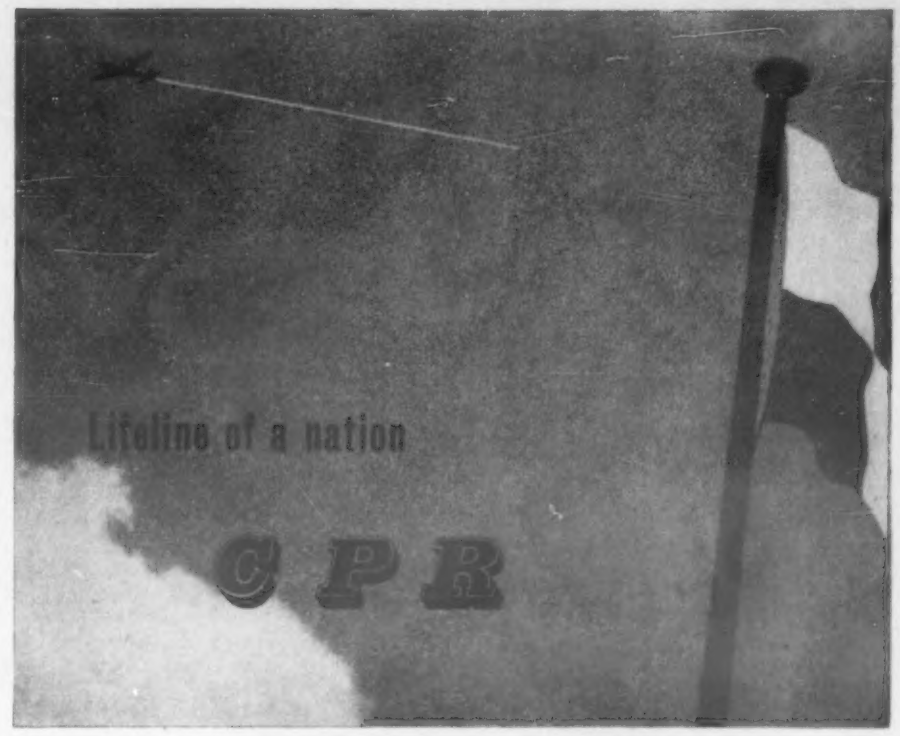
Overcoming Difficulties

Central African Airways has not had an easy growth. It had to cope with an extemporised base for more postwar years than most of its fellow airlines and it has had also to meet the problems of operating largely in tropical and semi-tropical conditions with new types of aircraft and thus to find out their abilities in such circumstances. It has also been faced with the need to cover a very large area territorially which cannot by its nature develop substantial traffic quickly. Nonetheless, although there has been a temporary decline in traffic, the chairman, Mr. A. E. P. Robinson, was able to say recently that no further subsidy would be sought during the current financial year. This was due to the many savings effected and to the process of reorganisation which had been taking place—the subsidy for the year is £160,000. The future is not easy to forecast. The present conditions in the Federation of Rhodesia and Nyasaland are hardly calculated to encourage pleasure travel, while the recent check to copper may reduce the ability of the Copper Belt inhabitants to contemplate air holidays. Such deterrents should only be of the short-term variety.



Checking a Bristol Hercules engine prior to re-installation; right, rebuilding a de Havilland Beaver

* Previous article appeared March 15, 1958.



Speak of Canada and you speak of the Canadian Pacific. Look into Canadian history and you find the CPR. Bold enterprise has been part of the CPR tradition ever since the first heroic days when the railway was driven through the Rockies. By land, sea and air, Canadian Pacific transport services are backed by great experience and all that is best in modern technical development. Scenic-domed trains, exclusive to CPR in Canada, run daily on the transcontinental trip between Montreal and Vancouver; the Empress of Britain and Empress of England, newest of the 'White Empresses', ply regularly between Liverpool, Greenock and Montreal or Saint John; fast freighters serve Canadian ocean and Great Lakes ports from the U.K. and the Continent; Bristol Britannias hum swift and smooth on the Amsterdam-Vancouver polar route, just one of Canadian Pacific Airlines services to five continents.

A story of enterprise — to be continued

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NEWS FROM ALL QUARTERS

Monorail Scheme at Basildon

It is reported that there is to be an experimental monorail installation about 1½ miles long at Basildon New Town in Essex, the site being made available by the Development Corporation there. A 51-passenger car would be used, constructed of alloy and plastics.

New Bridge over River Blythe

A Ministry of Transport grant will enable Northumberland County Council to complete a prewar scheme for building a 1¼-mile road diversion between Bebside and Sleekburn on the B1330 road. The embankment works were completed before the war. This £286,000 scheme includes a new steel cantilever bridge and viaduct, 400 ft. long, over the River Blyth.

Rover Tickets on Western Region

Unlimited rail travel on the Western Region for seven consecutive days is offered by the Western Region rail rover tickets now on sale. At a second-class fare of £9 (half-price for children), these tickets may be used for travel between all stations on the Western Region. For more than one person, the adult fare is reduced to £8 and that for a child to £4.

International Piggyback

The first international piggyback service between Canada and the United States will be inaugurated on March 23 between Toronto and New York by Canadian National Railways and the Delaware, Lackawanna and Western Railroad. It will be operated daily in each direction between New York, New Jersey and the Toronto Metropolitan area, carrying railway-owned trailers.

South Lancashire Rail Tour

The Railway Correspondence and Travel Society is organising a South Lancashire freight lines rail tour on April 4. The special train will depart at 1.05 p.m. from Manchester Victoria and traverse the following route: Queens Road Junction, Bury electric line, Radcliffe, Bolton Trinity Street, Hallliwell goods branch, Bolton West curve, Horwich, Adlington Junction, Whalley loop line, Howe Bridge Junction (West), Bolton Great Moor Street, Plodder Lane, Eccles, Weaste Wharf, returning to Manchester Exchange at 5.21 p.m.

Sheffield Parking Scheme

A Sheffield joint committee on car parking and traffic regulation has recommended the comprehensive regulation of parking in nearly every street in the city's central area. It is proposed that an inner zone should have every street either "no waiting" or with a restriction on parking to one hour in four only, with the exception of streets around the city hall where present street car parks should continue. In connection with these proposals new one-way traffic systems in five streets are recommended. In the outer zone a similar pattern should be followed. A report by officers who have surveyed the parking situation says that at present the existing capacity of street car parks and regulated waiting streets is 990 vehicles; the scheme now proposed would provide a maximum regulated capacity of 3,758 vehicles.

Hudson Ferries to Stop

Services on two passenger ferry routes across the Hudson River run by the New York Central railroad system are to cease soon after more than 76 years of operation. Elimination of the service which is used by some 10,000 passengers daily, and which connects with the N.Y. Central railway's West Shore terminal, also foreshadows cessation of the company's West Shore passenger services, taking advantage of the 1958 Transportation Act.

Ticket Issue on Diesel Sets

Since diesel trains on the L.M.R. Birmingham—Sutton Coldfield line recaptured much of the lost rail traffic, difficulty has been found in running the morning services into New Street on time, a correspondent writes. As New Street is an open station tickets have to be collected at Vauxhall. So many rush on to the trains at the suburban stations without stopping for tickets that there is considerable delay in issuing receipts for unpaid fares at Vauxhall. An experiment is now being made with the use of ticket-issuing machines on the trains.

Fewer Seats for Smokers?

Preliminary investigations into the desirability of increasing non-smoking accommodation on London Underground suggested that a maximum of about 30 per cent of people smoked during their journeys, states Dr. L. G. Norman, chief medical officer of the undertaking. If that result was confirmed by further observations, the provision of 50 per cent of non-smoking cars ought to be enough for both smokers and non-smokers. At present, about 30 per cent of the accommodation on London Transport trains is reserved to non-smokers.

East Sussex Railway Preservation

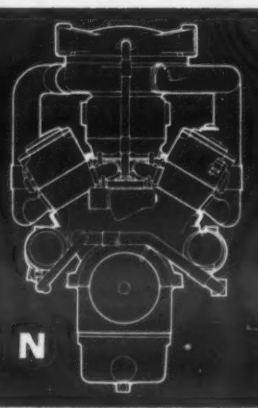
The Lewes—East Grinstead Railway Preservation Society has now been formed with the avowed objective of reopening the said line on a private basis. Its guiding lights are Mr. M. Eastland, of Haywards Heath, an engineering student, Mr. A. Sturt, of Brighton, an economics student, and Mr. C. Campbell, of Epsom, a London merchant banker. It is proposed to purchase a former Great Western Railway diesel railcar and run it between Horsted Keynes and Sheffield Park—a distance of some four and a half miles—during the summer season as a beginning. Members subscriptions have been provisionally fixed at one guinea, and 10s. for those under 16 years of age.

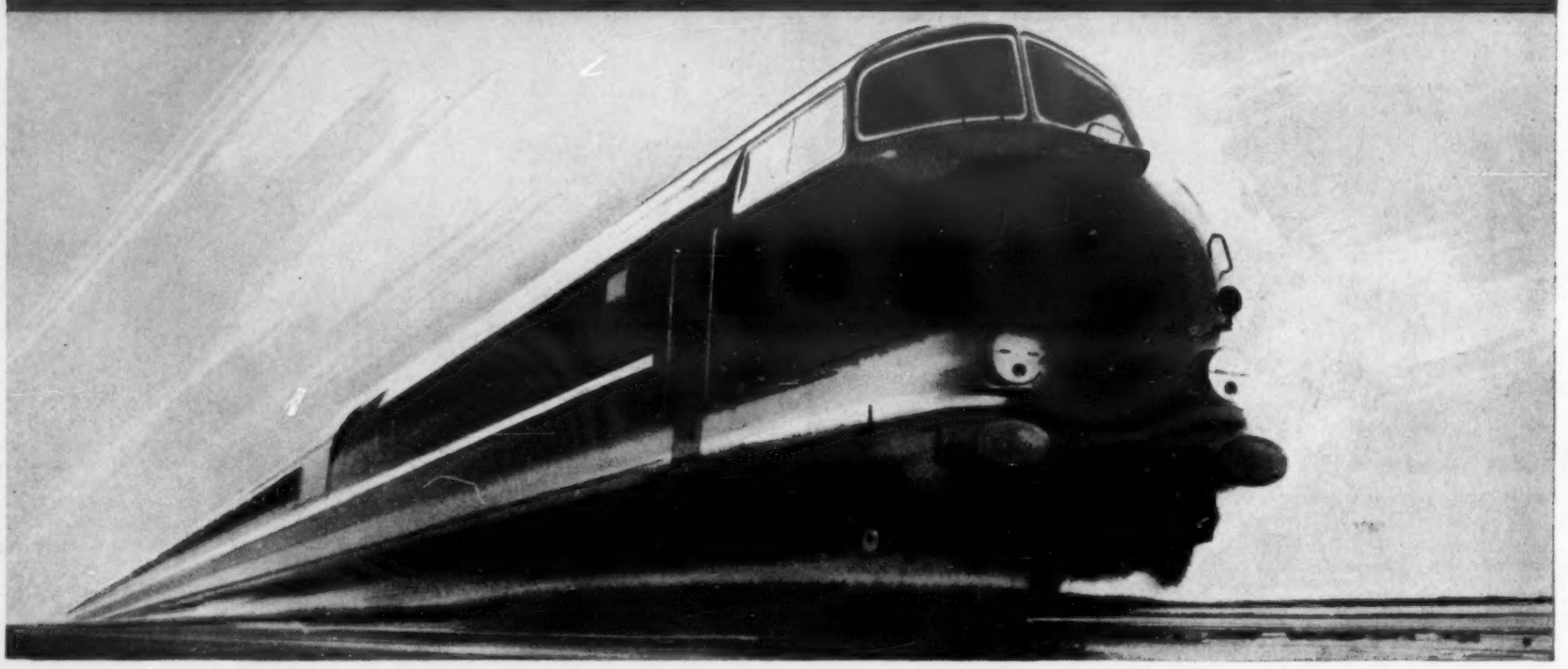
Hawkes Rail Fares Rule Rejected

The Transport Tribunal has rejected the application by Commander G. F. Hawkes, of Ardingly, Sussex, for a declaration that railway regulations under which excess fare can be demanded from second-class passengers occupying first-class seats are unreasonable. He had devised what he termed "Hawkes rules" for empowering such travellers to occupy first-class seats when none were available in the second class. The tribunal said that to concede second-class passengers the right Commander Hawkes suggested would create confusion especially at peak hours, with a scramble for first-class seats, and would result in a substantial diminution of railway revenue.

MAYBACH POWER

COMES TO BRITAIN





Armstrong Siddeley are now manufacturing under licence a range of diesel engines from 220 to 2,000 b.h.p. rail traction rating developed by the world famous German firm of Maybach, who have had 35 years experience in the manufacture of diesel traction units. Armstrong Siddeley Maybach diesel engines are currently being introduced into British Railways Western Region as part of their modernisation programme.

ARMSTRONG SIDDELEY **Maybach** *DIESEL ENGINES*

ARMSTRONG SIDDELEY MOTORS | COVENTRY · ENGLAND | MEMBER OF HAWKER SIDDELEY GROUP

ENGINE BUILDERS TO THE WORLD

COMMERCIAL AVIATION

Silver City at Manston

CHICAGO–LONDON NONSTOP

COINCIDENTALLY with the inauguration by the Southern Region of electric train services between London and the Kent coast on June 15, Silver City Airways will restore its Silver Arrow service between London and Paris. Whereas this has in previous years involved a coach journey between London and Ferryfield and railcar between Etaples (for Le Touquet) and Paris, this year the English surface link will be by train between Victoria and Birchington or Margate and coach thence to Manston. Silver City is to use this aerodrome which the Royal Air Force has been maintaining since the United States Air Force relinquished it a year or so ago. The Manston—Le Touquet service will be flown with 68-seat Handley Page Hermes aircraft. The French connection will, as before, be provided by diesel railcar and the overall journey time will be approximately seven hours. The return fare will be £8 19s. on all days and the initial frequency will be once daily in each direction. Plans are under consideration for the provision of railway spurs to both Manston and Le Touquet—a development which would enable British Railways, Silver City and French National Railways to encourage a new and most promising means of swift yet economic travel. Silver City may also operate vehicle ferry services from Manston, but it has no intention of reducing its use of its own airport at Ferryfield.

Air Ceylon to Trincomalee

The internal network of Air Ceylon is to be extended this month to serve Trincomalee also. The Dakota flying from Colombo to Gal Oya in South Ceylon will call also at Trincomalee. There will be flights on Tuesdays and Fridays.

K.L.M. Flights to Singapore

The British Government has decided to adhere to its decision to reduce the terminal rights accorded to K.L.M. (Royal Dutch Airlines) at Singapore. The Dutch operator will thus have to reduce its Amsterdam—Singapore flights from two to one a week from the end of the month.

Chicago—London Nonstop by T.W.A.

Nonstop flights from Chicago to London will be started by Trans World Airlines on June 5. Flying time for the journey from O'Hare Field, Chicago, to London Airport, a distance of just over 4,000 miles, will be 13 hr. 10 min. A nonstop service in the reverse direction, from London to Chicago, is planned to begin on August 1 with a flight time of 15 hr. 50 min. Both flights, initially, will be on a weekly basis.

Progress of Vanguard Flight Trials

The new Vickers Vanguard turboprop air liner, which made its first flight on January 20, had logged 50 hours in the air by March 11. This total was built up in 21 flights and represented an average rate of one hour flown daily since the first flight, which was regarded as very satisfactory progress for a new aircraft. The tests so far have not yet covered the full range of the Vanguard's performance, but the aircraft has already flown pressurised at heights of up to 26,000 ft. and speeds of up to 250 knots: the highest take-off weight so far has been 131,000 lb. (91 per cent of maximum).

Swissair Summer Programme

Extension of Swissair's Middle East network to include Ankara, Kuwait and Tehran (already foreshadowed in MODERN TRANSPORT), is among the main features of the airline's summer schedules which take effect on April 1. From that date, subject to government approval, services will be flown to Ankara via Istanbul on Thursdays and to Kuwait via Cairo on Wednesday evenings. Flights to Tehran will start on May 28. DC6Bs will fly to Barcelona, Madrid and Lisbon and will replace DC4s on the Geneva—Palma route while Metropolitans will be introduced between Zurich and Munich. Dakar will replace Recife as intermediate stop on the twice-weekly Supersuisso service to South America, both flights of which are to terminate in Buenos Aires, the Thursday flight being extended from São Paulo (subject to government approval), while the Sunday flight will additionally call at Montevideo.

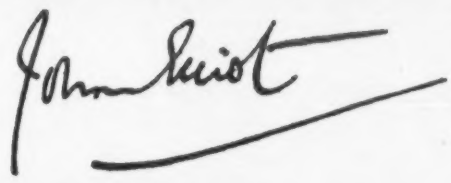
Boeing Intercontinental 707 Tests

Tests intended to lead to certification of the Boeing 707 Intercontinental long-range jet transports have been started by the Federal Aviation Agency and are proceeding at an accelerated rate, according to Boeing officials. The first two Intercontinentals have already flown more than 100 hours and are making almost daily flights. Flight test engineers said the increased test tempo was possible because of background and experience gained in testing the shorter-range Boeing 707-120s. The certification programme for the 707 Intercontinentals started on February 15 when F.A.A. representatives flew to observe air speed calibration tests. This was 35 days after the first Intercontinental made its initial flight. The second plane first flew on February 4. Both now are based at the Boeing flight centre and are scheduled for delivery to Pan American World Airways after being certified.

January Activity at British Aerodromes

Air transport movements at United Kingdom aerodromes in January numbered 16,985, a decrease of 0.4 per cent compared with January last year. The number of passengers handled increased by 6.7 per cent to 335,649 and freight picked up and set down amounted to 9,257.4 short tons, an increase of 20.3 per cent. Airports in the London area as a whole showed an increase of 2 per cent in air transport movements and an increase of 11 per cent in the number of passengers handled. At London Airport there were 7,108 air transport movements, a decrease of 2.6 per cent compared with January last year, and 196,786 passengers were handled, an increase of 4.4 per cent. Among the airports at which passenger traffic increased considerably over January, 1958, were Blackpool (Squires Gate) by 167.5 per cent to 824, Blackbushe by 99.1 per cent to 8,344, Edinburgh (Turnhouse) by 70 per cent to 8,660, Newcastle (Woolsington) by 61.6 per cent to 889, Lympne by 36.2 per cent to 2,183, Cardiff (Rhoose) by 18.5 per cent to 1,611, Ferryfield by 14.6 per cent to 2,676 and Belfast (Nutts Corner) by 13.4 per cent to 13,962. Many aerodromes had a fall in passenger traffic compared with January, 1958, the most marked being Croydon by 78.9 per cent to 411, Southampton (Eastleigh) by 53.9 per cent to 873 and Liverpool (Speke) by 23.5 per cent to 4,149.

CHAIRMAN OF LONDON TRANSPORT RETIRES



Sir JOHN ELLIOT, M.Inst.T.

• • • • • •

The retirement of Sir John Elliot, chairman of the London Transport Executive, was announced last week. His contract runs until 1960, but at his request the Minister of Transport has agreed to release him sometime later this year. He recently joined the boards of Thomas Cook and the Pullman Car Company. Born in 1898, he was educated at Marlborough and the Royal Military College, Sandhurst. Gazetted to the 3rd Hussars in 1917, he was on active service with his regiment in France, Belgium and on the Rhine until 1920, when he resigned his commission to take up journalism. After experience in America on the *New York Times* and in England on the *Daily Express* and *Evening Standard*, he joined the Southern Railway in January, 1925, as assistant to the general manager in charge of public relations and advertising. He succeeded in reviving public esteem towards the railway and in 1930 was appointed development officer in the newly formed traffic department and was responsible for reorganising the sales and canvassing arrangements of the company. Three years later he was made assistant traffic manager; he became assistant general manager in 1937. He occupied the position of deputy general manager, to which he was appointed in 1939, throughout the war and until October 1, 1947; he then took over the duties of general manager from Sir Eustace Missenden when the latter became chairman of the Railway Executive. He became chief regional officer, Southern Region, British Railways, on January 1, 1948, and was appointed to a similar position with the London Midland Region two years later. In February, 1951, he again succeeded Sir Eustace Missenden, this time as chairman of the Railway Executive. Just over two years later, when the Railway Executive was abolished and its functions absorbed in the British Transport Commission, he was invited to become chairman of the London Transport Executive; he took up that task on October 1, 1953. He was president, Institute of Transport, 1953-54 and vice-president, International Union of Railways, 1947 and 1951-53. Sir John was closely connected with the organisation of the railway-operated air services from their inception. In 1935, with Sir Eustace Missenden, he visited America and Canada to study rail, road and air conditions, and in March, 1949, he visited Australia at the invitation of the Government of Victoria to investigate railways and road transport in that State; following his report the financial structure of the railways was reorganised and rehabilitation begun. He is Colonel Commanding the Engineer and Railway Staff Corps, R.E. In 1947 he was awarded the U.S.A. Medal of Freedom with Bronze Palm for transport services to U.S. Forces in Europe during the war and in 1953 he was made an Officer of the Legion of Honour. He was knighted in the New Year Honours of 1954.

SIR JOHN ELLIOT

Retirement Announced

EXCHANGE OF LETTERS

FOLLOWING announcement of the retirement of Sir John Elliot, on a date to be arranged, from the chairmanship of the London Transport Executive, the following correspondence exchanged between Sir John Elliot and Sir Brian Robertson, Chairman of the British Transport Commission, has been made available:

London Transport,
55 Broadway,
London, S.W.1.
Chairman's Room March 3, 1959

My Dear Brian,

Now that my release from the chairmanship of London Transport has been agreed, I want to thank you for your ready understanding of my request, having in mind our talk in 1957, when I told you of my probable intentions regarding retirement.

The business of London's passenger traffic, in which I have spent nearly 38 years, the bulk of it with the Southern Railway and London Transport, has been an absorbing task, and I shall continue to watch it with the greatest interest. Though the problems grow more acute every year (particularly, giving the public the service they demand at a price they are prepared to pay), I have no doubts about the capabilities of those I shall leave behind in London Transport to find the answers, under their new chairman. Indeed, they must do so, for London Transport will continue for the foreseeable future to be an essential part of Greater London's life, as it has been for so many years past.

I look forward to my re-association with Thomas Cook and Son and the Pullman Car Company, with both of which I have worked for many years, and I shall hope to be of some help to you and the Commission in this way.

May I say that it has been an inspiration to have had such a close association with you through six difficult but interesting years, and I am most grateful to you for your unfailing confidence and friendship, at a time when you have had so much on your hands in the wider field of transport as a whole. In this I am sure you will win through to full success, and soon.

Yours ever,
John

Sir Brian Robertson, Bt., G.C.B., &c.,
Chairman,
British Transport Commission,
222 Marylebone Road,
London, N.W.1.

British Transport Commission,
222 Marylebone Road,
London, N.W.1.
Chairman March 7, 1959

My dear John,

Thank you for your letter of March 3.

The formal relationship between London Transport and the British Transport Commission could admit the possibility of friction between the two organisations. I am very grateful to you for the fact that during these nearly six years in which you have been chairman of the Executive, there has been complete harmony between us.

London Transport has a very difficult task and, so far as I can see, one that is likely to become more difficult still. Your successor can be thankful, as I am, for the capable manner in which you have managed the business during your own time in office, as well as for the way in which, within the limits of possibility, you have prepared for the future.

I shall miss you very much at 55 Broadway but I am happy to think that our association will continue in another field.

Yours ever,
Brian H. Robertson

Sir John Elliot

IN PARLIAMENT

Brake Tests on the Highway

ASKED about the appointment of authorised examiners for brake-testing on public roads under the 1956 Transport Act, MR. G. R. NUGENT said that an applicant had to state what public roads, if any, he intended to use for vehicle testing. No appointments would be made unless technical officers were satisfied that the roads proposed, or others nearby, could be used for testing without danger or undue inconvenience to the public and to other traffic. The garage testing scheme should be started in the summer.

A Question on Track Costs

In the course of some rather obscure questions by MR. R. PAGE to the Joint Parliamentary Secretary of the M.o.T., it transpired that he was asking whether, if rail transport were relieved of the upkeep of the permanent way, in the same way as road transport is relieved of the upkeep of the roads, it could not be run as an efficient service under public enterprise. MR. G. R. NUGENT said he did not think that shifting the cost of maintaining the permanent way would be a solution to the financial plight of the railways.

SWEDISH STATE RAILWAYS

(*Continued from page* 11)

even greater than prognosticated in March in the poorer of the two possible trends. For this period, however, it must be noticed that private motoring was forbidden on Saturdays and Sundays in Sweden during January and part of February, 1957, owing to the Suez crisis.

And then came the period May-August, when the new tickets were sold for three months. To our own surprise, says Mr. Scherman, the number of ordinary return tickets sold was higher than in 1957, and to this number may be added half of the number of journeys of the new tickets, as every such ticket can be said to be equivalent to five return journeys. If all these had been used—but that may not be the case as the tickets are valid a whole year—we can state a rather considerable increase in the number of journeys and also in the receipts (the fares were, however, raised by about 5 per cent in February, 1958). The evolution is shown on the graphs on page 11.

Public Opinion

In order to record what public opinion really is, questionnaires were distributed to 100 firms and industries, and on September 11, 12, 13, 1958, also to travellers in the trains. As to the firms and industries, there is hardly any interest in the new facilities, as they still intend to use their own cars for business journeys. On the other hand, the travellers in the trains have expressed their great satisfaction.

So from this experiment we have learned, that it *seems* to be possible to stop the downward tendency by price adjustments in connection with good travelling facilities and public relations, but—as already mentioned—it is too early yet to be quite sure of the development to come. Last September it was decided to introduce these "partibiljetter" also between Linköping and Stockholm (209 km or 130 miles) and between Norrköping and Stockholm (163 km or 102 miles) from October 1, with a reduction of about 15 per cent, states Mr. Scherman.

ROTTERDAM UNDERGROUND SCHEME

Report by City Authorities

A REPORT issued in January by the city authorities of Rotterdam gives full details of the underground railway system which has been planned for the city and on which work is to begin as soon as possible. The system will consist of one route, 5 km. long, running from the main Central railway station, through the commercial and shopping centre of the city and under the River Maas to the left-bank suburbs of the city.

Diagram of proposed route; arrows show suggested future extensions

Wide Studies

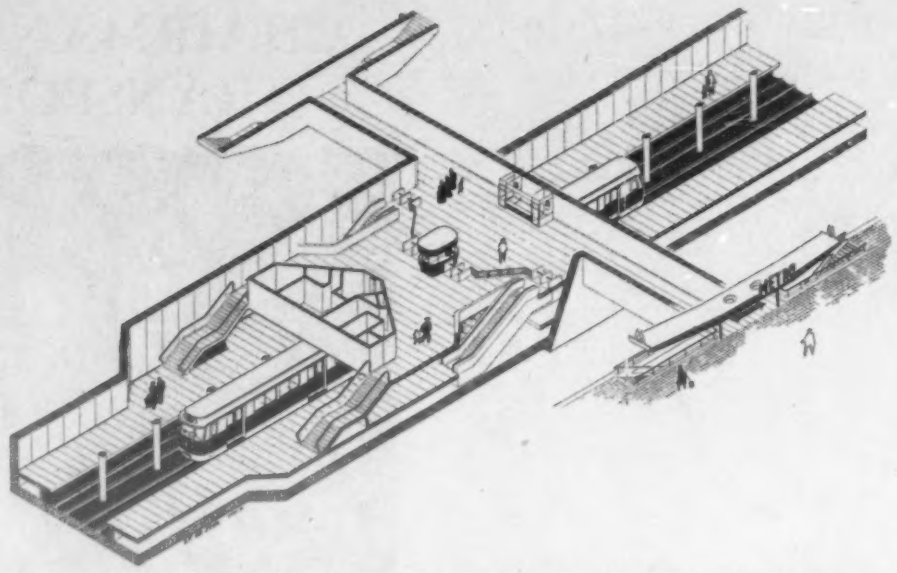
The decision to build an underground system was taken only after detailed study of tram and bus potential in the future and consideration of the Alweg system as a new transport medium which might possibly have been introduced. The operation of such a service, however, would not have been economic in Rotterdam, it was decided by the transport study group in charge of the project, and what had seemed the main advantages of Alweg operation at first—such as saving in weight in construction and the relative cheapness of viaduct erection—were proved by closer study to be more apparent than real. It was therefore recommended that a modern style of conventional train unit, such as that already used in Europe and North America, be resorted to as the new medium to solve the ever-growing transport problem between the commercial areas on the right bank of the Maas and the residential suburbs on the left bank. Underground systems were examined in detail by a working party from Rotterdam which visited Canada, the United States and the Hamburg network. From this last source several ideas were obtained which have been incorporated into the final plan.

The underground plan, which has met with official support, provides for a seven-station line, four of the stations being on the right and three on the left of the river. Termini will be Central Station (or, more commonly, simply C.S.) on the right bank and Zuidplein on the left bank, with intermediate stations at Hofplein, van Hogendorpplein, Schiedamsedijk, Hillelaan and Graansilolaan. Distances between stations will be: C.S. to Hofplein, 600 metres; Hofplein—van Hogendorpplein, 450 metres; van Hogendorpplein—Schiedamsedijk, 650 metres; Schiedamsedijk—Hillelaan, 1,550 metres, of which some 1,000 metres will be directly under the Maas; Hillelaan—Graansilolaan, 950 metres; and Graansilolaan—Zuidplein, 700 metres.

Station Layout

On the right bank of the Maas, stations will be placed below ground level; those on the other side of the Maas will be elevated. In the case of the underground stations, the first level will be the booking hall, which will be directly below road level, and the second the track and platforms, reached by descending stairs or an escalator from the hall; the entrance hall of the elevated stations on the left bank will be at ground level and the track reached by ascending steps. In both cases the steps or escalator will be separated from the booking hall by either a check point manned by a station ticket inspector or perhaps by an automatic coin-operated turnstile.

The possibility of using such a turnstile is being studied, as are the features of the American-style transparent "fare-box" and automatic dispensing of tickets from slot-machines in the interests of staff economy. Another staff-saving idea, which originates in Hamburg, is that of using a television screen to permit only one stationman instead of two to cover the two platforms of twin platform stations; it seems at present that all intermediate stations will have side platforms and the two termini island platforms. Rotterdam, adopting practice in Hamburg and in other cities with similar rapid transit systems, has allocated to this single stationman the job of signalling for doors to close and for the train to depart, procedure which obviates carrying guards on the trains.



Isometric view of one of the proposed underground stations below Coolsingel (Hofplein or van Hogendorpplein—the main street of Rotterdam

Capacity

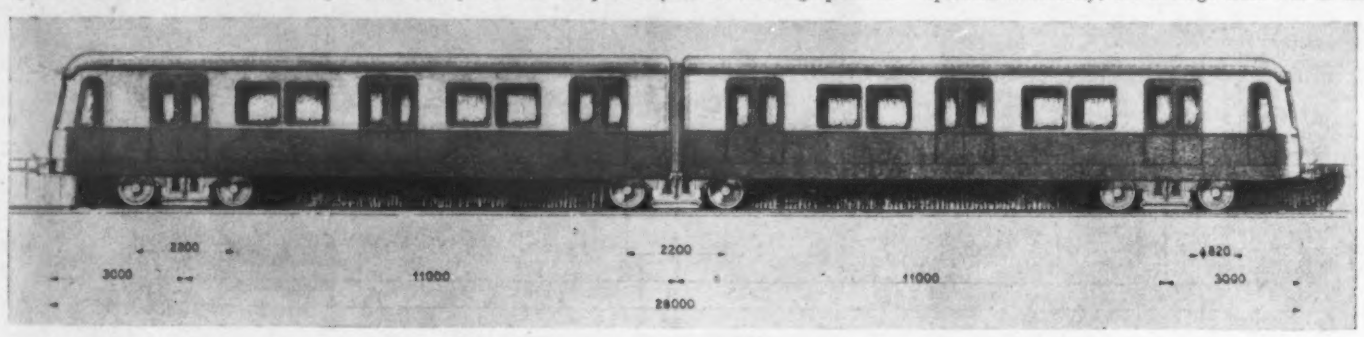
The main station of the line will be C.S. This will be built under Stationsplein, the square outside the main station which also serves as a loop terminal for many tram, local bus and interurban bus routes. It will thus become a changing point for three other transport media and provide a much-needed direct service between the station and the left-bank suburbs. The other terminus, Zuidplein, will act primarily as an exchange point for many of the bus routes operating left of the Maas.

Passenger capacity on the line will be between 30,000 and 40,000 in each direction per hour, as against an hourly capacity of the conventional trams at present used in Rotterdam of beween 10,000 and 12,000 working to a similar headway. The necessity for this large rise in carrying potential is shown by estimated figures for passenger loadings on routes to the left-bank suburbs in 1965; by then peak-hour loadings on public transport will have risen to a maximum hourly rate of between 17,000 and 19,000, with a rate during the peak quarter-hour equal to well over 20,000.

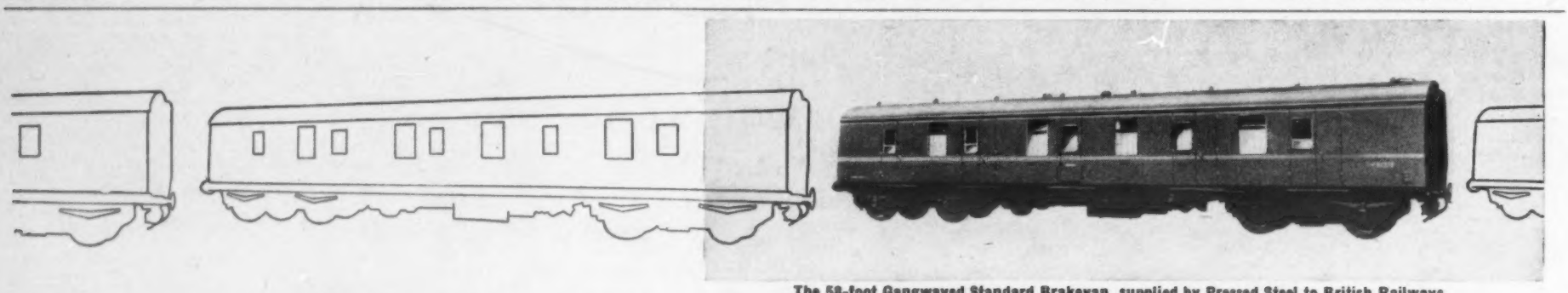
Services

High-frequency services are desirable, says the report, frequent services of low-capacity trains being preferable to less frequent services of high-capacity trains. With cars capable of carrying 250 passengers and three and four-unit trains to be operated eventually, the average train will in the future have a capacity of 870 passengers. This means that, with loadings over the peak 15 minutes of 5,170 in one direction expected by 1965, frequencies will have to be set at 2½ minutes in each direction. Greater loadings and capacities are possible in the more distant future. Waiting time at stations is expected to be short—between 10 and

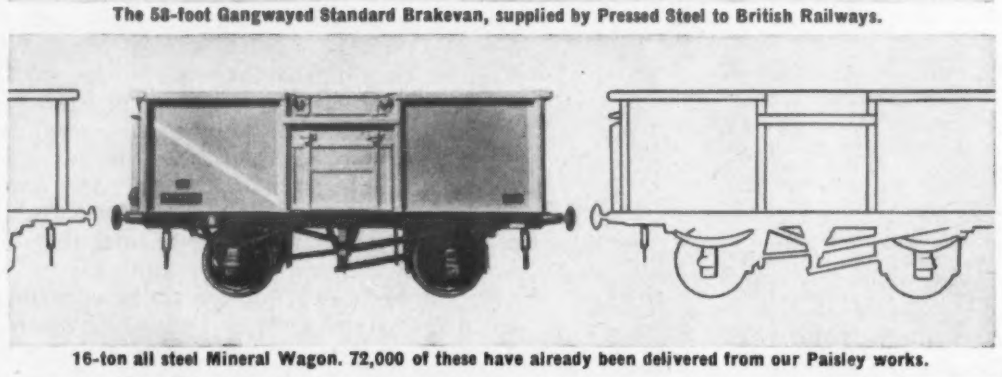
(*Continued on page* 22)



Elevation of proposed articulated two-coach train set for first line of Rotterdam Metro system



The 58-foot Gangwayed Standard Brakevan, supplied by Pressed Steel to British Railways.



16-ton all steel Mineral Wagon. 72,000 of these have already been delivered from our Paisley works.

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21-ton Hopper-type Wagon with drop bottom door for minerals, as used by British Railways.

Broad-gauge Covered Wagon type C.R., as used by Indian Railways.

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QUEENSLAND RAILWAYS

Losses Due to Drought

LATEST information regarding the Queensland Government Railways is available in the report of Mr. E. V. Moriarty, Commissioner for Railways, for the year ended June 30, 1958. The system consists of 6,456 miles of track, of which 6,357 miles are of the 3 ft. 6 in. gauge. Only 69 miles (from South Brisbane to Border Tunnel) are of standard (4 ft. 8½ in.) gauge; the remaining 30 miles, of 2-ft. gauge, represent the Innisfail and Mourilyan Tramways. Additionally there are 52 miles of 3 ft. 6 in. gauge tramways in the hands of local authorities and private companies.

In common with railways the world over those in Queensland had a bad year, the gross earnings of £33.814 million being nearly £2 million less than in the previous year largely owing to a decline in agricultural production resulting from the drought and to a fall in mineral traffic from the Mount Isa Mines consequent on a drop in overseas metal prices. Morever, the depression arising from the drought had a marked effect on purchasing power, which was reflected in reduced freight traffic and fewer country passengers. Reduced traffic on the Great Northern Railway was such that it was not possible fully to employ train crews who, nevertheless, under the Railway Award, had to be paid guaranteed time at certain depots.

Financial Results

Although there was a reduction of £940,000 in working expenses, gross earnings exceeded them by £2.197 million, and the total deficit, after adding interest charges, amounted to £5.649 million. Gross capital indebtedness at June 30, 1958, amounted to £91.137 million, an increase of £4.546 million over the figure 12 months earlier. It is pointed out that the reduction in working expenses would have been much greater but for the fact that the department had to bear an additional £522,496 "because of basic wage and automatic increases and award variations." Nevertheless, special measures to reduce overtime and Sunday working resulted in a saving of £770,985.

Passenger revenue (£3.322 million) declined by £168,406, but there was an improvement of £9,926 in earnings from parcels traffic (£1.289 million). Parcels traffic is stated to be highly competitive and a means of countering this has been found in the introduction of a "pick-up" service in Brisbane under which parcels from warehouses and stores are collected by railway-owned road vehicles; the traffic is increasing and at present 13 vehicles serve 131 different business houses, collecting from 9,000 to 10,000 parcels a week ranging in weight from 1 lb. to 2 cwt.

Freight Traffic

Freight earnings at £23.77 million represented a decline of £1.716 million, of which £395,155 was accounted for by the failure of the wheat crop. The department has adopted the policy of running freight trains on selected services at passenger train speeds. Trains now leave Brisbane at 2.35 p.m. on Monday to Friday inclusive and arrive at Townsville at 4.23 a.m. on Wednesday to Sunday. The train is scheduled to arrive at Townsville in advance of the "Sunlander" express, to which are then attached wagons for Innisfail and Cairns, enabling goods to reach the latter destination within 48 hours of their departure from Brisbane, 1,043 miles away.

Another useful step has been taken. By marshalling at the head of trains selected types of rolling stock with greater drawbar strength, loads for diesel-electric locomotives have been increased by at least 20 per cent. Whereas, for instance, 650 tons was formerly the maximum load from Bowen north to Townsville the larger type of diesel-electrics are now hauling loads of 1,000 tons and upwards. Similarly, on the main line the through load from Brisbane to Woowoomba for the largest type diesel-electric has been raised to 500 tons and the down load to 735 tons, as compared with 425 and 610 tons respectively. It is proposed to equip future wagon stock with drawgear providing a drawbar pull of 40,000 lb. which will enable the largest diesels to haul trains of 1,200 tons where crossing loop lengths permit.

Motive Power

With a stock of 58 diesel-electric and 767 steam locomotives no less than 30 per cent of the traffic train-miles during the year were run by diesel-electrics. The average freight train load has risen in the last five years from 308 to 329 tons, and in the same period gross ton-miles hauled per traction mile increased from 190.63 to 207.68; these improvements have been due to the greater use of diesel-electric traction.

During the year 34 obsolete locomotives were condemned and the only ones remaining to be delivered were five main-line diesels from the English Electric Company, Brisbane. "The question of placing orders for more diesel-electric locomotives will have to be seriously considered when money is available," states the report. "A large number of steam locomotives which had outlived their economic life already have been scrapped, but there are others in such a condition that their perpetuation in traffic would not be economic and it is proposed to scrap them. With the increasing age of other steam locomotives and the growing weight of repair demanded by them as they become progressively older it is desirable that there should be a continuous programme of new construction, and with the advantages of diesel-electric traction being so apparent the extension of diesel-electric locomotives to other sections will have to be considered."

Carriages and Wagons

The only new coaching stock placed in service during the year consisted of 18 second-class brake vans from the Ipswich railway workshops; 199 new wagons comprised 102 steel box cars from A. E. Goodwin, Limited, of New South Wales, 26 refrigerator cars from Commonwealth Engineering (Qld.) Pty., Limited, and 71 cattle wagons from the railway workshops: 329 obsolete wagons were written off.

An order has been placed with Commonwealth Engineering for 300 WHX wagons of 14 tons tare weight and an allowable gross weight of 40 tons for bulk grain traffic; they will be fitted with cast-steel bogies and roller bearings. Delivery is expected to begin next month and it is estimated that when the order is completed there will be sufficient high-capacity wagons to meet all demands for bulk grain transport for some time to come.

In connection with the quadrupling of tracks in the Brisbane suburban area power signalling is being installed on the Roma Street-Corinda section for which a tender of £979,599, submitted by McKenzie and Holland (Aust.) Pty., Limited, has been accepted.

Loan funds are stated to have been expended mainly on the construction of rolling stock, quadruplication and duplication works in the Brisbane suburban area, new workshops and stores buildings at Redbank, new workshops at Banyo, new depot at Northgate for diesel-electric locomotives and air-conditioned cars, additional buildings at workshops and depots, new machinery for workshops, interlocking and signalling, additional siding accommodation, three new bridges and a variety of other items.

★

A MOBILE BANK

For Service in Rhodesia

A MOBILE bank based on a Karrier Bantam 2-3 ton chassis has been supplied to the Standard Bank of South Africa, Limited. The vehicle is to be operated in and around Salisbury, Rhodesia, and it will provide banking facilities in areas where the volume of business is such that it would be uneconomical to open permanent offices.

The mobile bank on a Karrier Bantam chassis

The Luton-type bodywork, by Rootes, Limited, Maidstone, is of all-steel construction and fully insulated against heat. In addition a ¼-in. thick aluminium checker plate shield is fitted over the roof. The vehicle's interior is equipped with a counter, customers entering the body at the rear through two hinged doors which are designed to fold and clip against the body sides. Provision for a safe is made below the counter, the floor adjacent to this area being specially strengthened.

The first main-line diesel-electric locomotive to be supplied to British Railways against repeat orders was Type 2 D5520 which is here seen leaving the Loughborough works of the Brush Electrical Engineering Co., Limited. There are already 20 of this type in service on the Eastern Region, an order which was completed ahead of the delivery schedule. The first unit in the new order was six weeks ahead of the contract date

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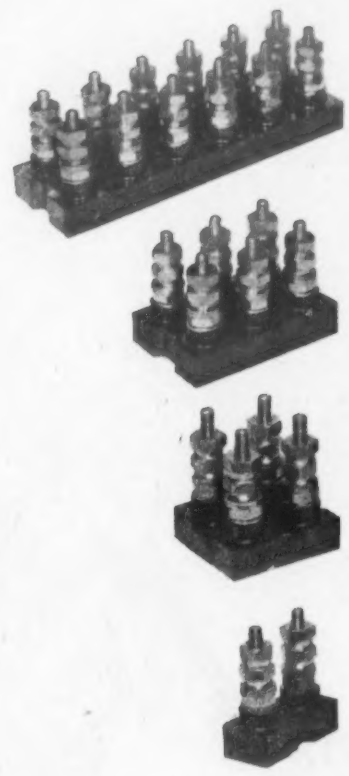

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CANPAC PIGGYBACK

Over 50,000 Trailers Carried in a Year

An estimated 51,650 highway trailers were carried on railway flatcars in 1958 by Canadian Pacific Piggyback Services in Eastern Canada and Canadian Pacific Transport Company in Western Canada. This figure, comparing with a total of 24,059 trailers carried by trains in 1957, gives a magnified ratio of growth, however, because Canadian Pacific only began to carry motor common carrier "for hire" trailers (trailers not owned or operated by the company) in October, 1957.

Between October 9, 1957, and the end of that year, Canadian Pacific handled 4,660 trailers for independent highway transport operators, and this figure jumped to 42,415 in 1958, first full calendar year of operation. Steady growth of piggyback operations, which combine the flexibility of highway transport with the efficiency of intercity railway mass transport, is anticipated by Canadian Pacific which now has 653 specially-equipped flatcars assigned to this type of service. The equipment on the flatcars consists mainly of hitching devices to hold the trailers in place during transit and roller bearings to enable the trains to move on passenger train schedules and with fewer stops than are required for regular fast freight trains.

Advantages

Many shippers have found advantages in the speedy and dependable transportation and easy pick-up and delivery which this type of service affords. In Eastern Canada, Canadian Pacific Piggyback Services now offers facilities to motor common carriers between seven points: Saint John, N.B., Montreal, Ottawa, Toronto, Fort William, Dryden, Ont., and Winnipeg. In addition, Canadian Pacific offers piggyback service with its own trailers between Montreal, Toronto, Hamilton and London, Ont.

In Western Canada, Canadian Pacific handles, under an agreed charge arrangement, trailers belonging to trucking subsidiaries—Canadian Pacific Transport Co. Limited, in Manitoba and Saskatchewan, Dench of Canada, Limited, in Alberta, and O.K. Valley Freight Lines, Limited, in British Columbia—which contain truck-billed traffic. Points served in the west are Winnipeg, Brandon, Regina, Saskatoon, Swift Current, Medicine Hat, Lethbridge, Calgary, Edmonton, Red Deer and Vancouver. Road transport services in Western Canada use a fleet of 500 trucks and trailers in covering some 3,000 highway miles. Of these 275 are semi-trailers owned and operated by Canadian Pacific Transport.

C.P.R. Haulage Interests

In the east, there are 46 railway-owned semi-trailers assigned to the all-rail piggyback service between Montreal, Toronto, Hamilton and London. In order to round out its highway freight facilities, Canadian Pacific last year acquired a controlling interest in Smithsons Holdings, Limited, which owns Smith Transport, Limited, largest trucking company in Canada, whose operations, together with a number of affiliated companies in the highway transport business in eastern Canada, extend over some 7,000 highway route miles from Nova Scotia to Manitoba. Canadian Pacific owns or controls trucks operating over almost 10,000 route-miles, extending from coast to coast.

Canada's main piggyback operation is between Montreal and Toronto, where Canadian Pacific offers overnight delivery in each direction on the 340-mile route. Two solid piggyback trains are operated each way four nights a week, Monday to Thursday inclusive, and one all-piggyback train each way on Friday and Saturday nights. Piggyback traffic on other routes is handled on regular fast freight trains.

Average Length of Haul

In Eastern Canada, the average piggyback haul for common motor carriers is 415 miles and for railway-owned trailers, 350 miles. In the west, the average Canadian Pacific Transport haul is 412 miles. These figures compare with Canadian Pacific's average freight haul of 466 miles. Although piggybacking is usually considered a modern development in railroading, it goes back at least 100 years on one subsidiary of Canadian Pacific. When the Dominion Atlantic Railway in Nova Scotia opened in 1858, piggybacking of horse-drawn carriages accounted for 15 per cent of the system's business.

Another interesting development in piggybacking occurred last October, when for the first time two common carrier trailers were carried on flatcars attached to Canadian Pacific's passenger train No. 6 between Winnipeg and Fort William.

The Asian Highway

(*Continued from page 6*)

(Iran) to Pakistan goes on to Quetta from where there are connections with Lahore and southwards to Karachi. (An alternative route from Karachi both to Quetta and to Iran is being developed via Las Bela and Kalat; this joins the Zahidan-Quetta road at Mastung.)

From New Delhi, the road east passes through Agra, Calcutta and Imphal to the Burma border with a link from Raniganj to Katmandu (Nepal). At Agra a road south leads through Indore (from where there is a connection to Bombay), Hyderabad, Bangalore (with a connecting road to Madras), to Colombo by means of a ferry service between Danushkodi on the mainland and Talaimanar on the island of Ceylon. From Golaghat in India there are two roads into Burma. The first passes via Imphal to Tamu and on to Mandalay through Kalewa and Shwebo, and the second via Ledo across the border to Myitkyina, Bhamo, Kyaukme and so to Mandalay. From Mandalay, there is a road via Meiktila (from where the main road goes to Rangoon) and Taunggyi to the border with Thailand by Hawng Luk. It is understood that a bilateral agreement has recently been concluded for the building of a bridge to link Thailand with Burma. From the frontier with Burma, the road leads to Bangkok. From Bangkok roads radiate north to the Kingdom of Laos, south to the Federation of Malaya on to Singapore, and east to Cambodia. In Cambodia, the road passes through the capital, Phnom Penh, to the border of the Republic of Viet-Nam. From the Vietnamese border, the main road leads to Saigon, the capital, from where another roads goes to Quang Tri, the northern town in southern Viet-Nam.

Standards

Attention has been drawn in ECAFE to the necessity for establishing standards for international highways which could be adopted for stage by stage construction. In the meantime, those countries where road construction was not sufficiently developed, could endeavour to conform at least to the minimum standards proposed. Basic data regarding international highways in the more advanced countries was also given and the suggestion made that in the construction or improvement of their roads, countries of the region should, as far as possible, take advantage of locally available materials and strengthen banks by soil stabilisation methods.

The project was discussed by the Highway Sub-Committee at its fourth session which met in Bangkok in November, 1958. The sub-committee fully realised that there had been a general awareness on the part of the governments of the region of the important role which international surface communications could play in the economic, social and cultural development of the region. It felt that the time had come for the secretariat to initiate action on all aspects of the problem of developing international surface communications, for promoting governmental interest in and for facilitating the implementation of the project. In this connection, the sub-committee also noted that, in the case of land-locked countries, international highways were practically the only means by which trade and commerce between neighbouring countries would serve to give at least indirect access to the sea.

Method of Work

The sub-committee appreciated that it would not be possible to develop immediately the entire route falling in each country to the full and final standard of the international highway owing to the high cost of such development. It therefore accepted the proposal to formulate a few standards for such development and agreed to recommend to the countries that improvements, at least to a minimum standard, should be the immediate objective. It was decided that the countries concerned should be requested to give their opinion of the plan as a whole, offer detailed comments on that part of it applying to their own country, study how far their national highway plans could meet the international requirements and what assistance they would require for implementing their programmes within a given period. The ECAFE area is vast, and the sub-committee therefore felt that the many problems connected with the introduction of international highways could best be considered by dividing the area into three zones and convening meetings of expert working groups. The first working group should meet at Bangkok to consider the road network of Viet-Nam, Cambodia, Laos, Thailand, the Federation of Malaya and Burma; the second should meet in New Delhi to cover Burma (western connections), East Pakistan, Ceylon, India, Nepal and connections to West Pakistan; and the third should meet at Lahore to cover West Pakistan, Afghanistan and Iran. The terms of reference for the working group as laid down by the Highway Sub-Committee (fourth session) are as follows:

1. To consider the proposal submitted by countries within the zone covered and recommended; the routes to be followed; the standards to be adopted for such routes; and any other pertinent factors.
2. To consider and recommend priorities of highway construction and rehabilitation.
3. To consider and make recommendations on any other factors which would facilitate international traffic.

Reopening Old Caravan Routes

The sub-committee was unanimous in its view that the first priority should be to consider the linking of existing road systems and secondly to bring existing roads up to the required standard, if necessary by stages. Once the existing roads are linked with each other the Asian highway will come into being, though a series of technical problems and frontier difficulties will have to be solved. In a sense, the old caravan routes will be reopened and an ancient dream will be recaptured. Such is the persistent and poetic cycle of history.

★

UNDERGROUND SCHEME FOR ROTTERDAM

(*Continued from page 20*)

20 seconds—and the journey time between termini between 10 and 12 minutes.

The rolling stock used will consist of 32 two-coach articulated sets carried on three bogies. Each unit will weigh 34 tons, be 28 metres (92 ft.) long, 2.7 metres (8 ft. 11 in.) wide and 3.5 metres (11 ft. 6 in.) high. The floor height will be 1.05 metres (3 ft. 5⅜ in.) above the rails and the door opening will be 1.15 metres or 3 ft. 9¼ in. Double power-operated doors with driver-closing control are to be provided. Although 308 passengers may be carried in each of the 60-seat carriages, under a Netherlands Government regulation (originally covering buses) allowing a carrying maximum of seven standing passengers per square metre of floor space, Rotterdam sets the unit capacity at 250. In the first instance it is expected that the Rotterdam Metro, as it will probably be named, will have three sets of cars under repair or inspection and 10 trains of two coaches and two trains of three coaches in service. Length of station platforms is to be 120 metres, to accommodate the four-coach trains which are planned for the future. The trains will have P.C.C.-type bogies and a protected conductor rail will be used.

Cost

Signalling and power supply alone will cost somewhere between £320,000 and £400,000. Total cost of the project is estimated at 129,300,000 guilders (about £12,850,000). This is divided into 31,300,000 guilders (about £3 million) for operational equipment—of which sum rolling stock will take up 13,500,000 guilders, buildings and stocks 10 million guilders and track 7,800,000 guilders—and 98 million guilders (about £9,700,000) for civil engineering works. Of these the under-river tunnel will absorb 30 million guilders, right-bank works about 44 million guilders and left-bank way and works 14½ million guilders.

Although the present scheme is barely under way, plans are being made already for the extension of the underground network in Rotterdam. Envisaged is the extension of the line on the left bank from the Zuidplein terminus in the direction of Zuidwijk—Pendrecht—Hoogvliet and the laying of another line on the right bank, starting from the C.S. terminus and running east. These projects are still in the stage of preliminary investigation, however, and there is no definite information as to when they will be finalised.

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THE SWISS COMMERCIAL VEHICLE INDUSTRY

*2—Saurer Diesel Development**

THE need for preserving torque output at low engine speeds under load indicated to the Saurer Company that a positive displacement supercharger should be used, ruling out the simple Roots-type unit, while the wish to avoid complexity and keep space requirements as low as possible appeared to preclude a reciprocating unit. In the upshot it was decided to examine the possibilities of the Lysholm type of rotary compressor, which has an outward appearance similar to that of the Roots unit but in which the two rotors have three helical lobes of a patented shape, with exceptionally small clearances, and porting arranged to provide internal compression. Saurer development work has been centred on evolving a rotor type and form that would give the required high overall adiabatic efficiency to provide acceptable fuel economy in automotive applications and which could be produced easily. The final design of hollow rotor, cast in halves, with cylindrical cross section enabling accurate grinding to close tolerances to be simply performed, appears to have accomplished both objectives.

The Saurer helical-lobe supercharger is made in three sizes to match the whole range of engines, the later types of which have a suitable mechanical drive incorporated in the engine design. With earlier engines, the blower can be belt-driven and a gear train is incorporated in the blower casing to provide high rotor speed without excessive belt speed. Performance of the supercharged units is outstandingly good, 30 to 40 per cent increase in maximum horsepower compared with unblown similar units and excellent low-speed torque being regularly obtained. That these results are achieved with an increase in specific fuel consumption of only 1 to 2 per cent is quite remarkable for a mechanically driven supercharger, while blower noise level is considerably below that of the Roots-type instrument. The development of the supercharger has widened the horsepower range of Saurer diesels considerably; the coverage now offered is from 45 to 300 b.h.p. with only five basic engine types of from four to 12 cylinders.

Saurer longevity is typified by this Type 2LC which is more than 25 years old and still used by a Basel miller. It has a four-cylinder 80-h.p. engine

Further Advances

Significant advances have been made recently by the company beyond these already highly satisfactory results, helped by the use of an intercooler, also of Saurer design, between compressor and manifold. With supercharger and intercooler mean effective pressures up to 175 p.s.i. are being obtained, an outstanding example being a four-cylinder engine set to give a 100 per cent increased power output compared with its normally aspirated counterpart. This unit now produces 160 b.h.p. from 5.8 litres at about 2,000 r.p.m. for a full-power specific fuel consumption said to be no higher than 0.4 lb. per b.h.p.-hr. It has been running satisfactorily in a lorry for many months apart from extensive bench running.

An interesting point about Saurer diesels is that the standard means of starting employed is compressed air, although electric starters are fitted when specified. The reason is probably to be found again in the absence of a Swiss components industry and in the fact that the components for air starting are more easily produced domestically than a high-torque electric starter, but the excellent starting by air at the very low temperatures obtaining under Alpine conditions is also important. The actual starting system used is of British design—the Heywood system which, assuming adequate pressure in the air reservoir, when operated provides by stages a charge of compressed air through a distributor to appropriate cylinders to start and maintain cranking, a charge of fuel-air mixture through the same distributor system and a charge of auxiliary fuel into the induction manifold. The Saurer-designed exhaust brake or obturator is a conventional butterfly valve in the exhaust manifold. Manual operation by a separate lever, as preferred by Swiss operators, is provided and there is automatic fuel cut-off when the obturator is in use and an interlock that prevents the exhaust brake being used if the accelerator pedal is off its closed stop, or the accelerator pedal from being depressed when the brake lever is away from the off position.

During the past few years a number of Swiss operators have shown their appreciation of the advantages of air cooling by a marked increase in purchases of Magirus—Deutz vehicles, which are all powered by Deutz air-cooled diesel engines. Certainly, apart from possible weight saving and greater accessibility and flexibility of engine positioning when the radiator is dispensed with, freedom from liquid-cooling system worries and necessary maintenance is a great attraction in a country where winter conditions are severe. Saurer is fully alive to the possibilities—and the possible threat—and has been studying the problems of air cooling for some time. We saw a standard four-cylinder CR1D engine converted to air cooling (becoming CR1K) in bench-running tests during our visit. This 5.3-litre unit weighs about 100 lb. less than the 1,000 lb. or so of the equivalent water-cooled engine, apart from the saving of radiator weight, and has been worked up to the standard unblown power output of 65 b.h.p. at 1,800 r.p.m. quite successfully. The next steps will no doubt be to study the effectiveness of air cooling at the higher output of 90 b.h.p. at 2,300 r.p.m. (150 p.s.i. b.m.e.p.) currently being obtained from this engine in liquid-cooled form with Saurer supercharger.

Vehicle Developments

The Saurer-Berna ranges, excluding O.M. vehicles assembled from imported Italian components, cover goods chassis with payload capacity from about 3 to 10 tons, various tractors and specialist and military cross-country types; passenger vehicles extend from the specialised small Alpine postal bus to the massive rear-engined articulated buses built for Zürich. Built to traditional standards of quality and strength, it is only recently that there has been any move towards offering forward control in goods vehicles or an underfloor-engined passenger vehicle. Specifications throughout the range have always been flexible, several engine power ratings and transmission arrangements, for example, being available for each vehicle type to enable a close match to be made to individual requirements. In addition, such items as air-operated steering servo, gear-changing, clutch-operating and handbrake servos and a differential lock have been available when specified for several years.

A typical heavy-duty trunk-haulage lorry in Switzerland is the Saurer S4C, a two-axle vehicle designed for a maximum gross weight of 15,000 kg. (14½ tons) but limited in general haulage to 13,000 kg. (12¾ tons). This vehicle is now available with forward control, for which a new pressed-steel cab has been developed, and offers a choice of diesel engines of 110, 125 or 160 b.h.p. driving through an eight-speed synchromesh gearbox with electro-pneumatic preselective gearchange. A fully equipped sheeted dropside S4C lorry has a tare weight as high as 6½ tons, depending on body type and equipment, leaving a margin of only 6½ tons to 7 tons at the lower permitted gross weight.

Good success has been achieved with the Saurer-Berna 2H rear-engined passenger chassis, which has the 5.8-litre four-cylinder diesel mounted vertically fore-and-aft on the centre line of a chassis rear extension, and this vehicle with various transmission arrangements, including the Diwabus automatic unit, has been used for buses and coaches with seats for up to 30 passengers. In response to demands for a higher-capacity bus to deal with peak traffic in the larger towns on routes not served by trams and trolleybuses, the 5DUP chassis was introduced in 1957. The first Saurer underfloor-engined vehicle, it was designed for direct integration of bodywork to the chassis to preserve a low floor height and became available last year with the Diwabus automatic transmission. Power is provided by a Saurer six-cylinder 10.3-litre engine set to give 160 b.h.p. normally aspirated or 200 b.h.p. with Saurer supercharger at 2,000 r.p.m. A number of Swiss municipalities are now equipping with the 5DUP fitted for standee operation with accommodation for up to about 90 passengers, and with the higher-powered engine to draw 70-passenger independent trailers.

* No. 1 appeared March 14.

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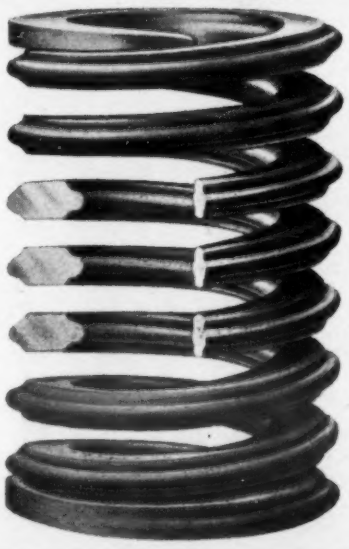

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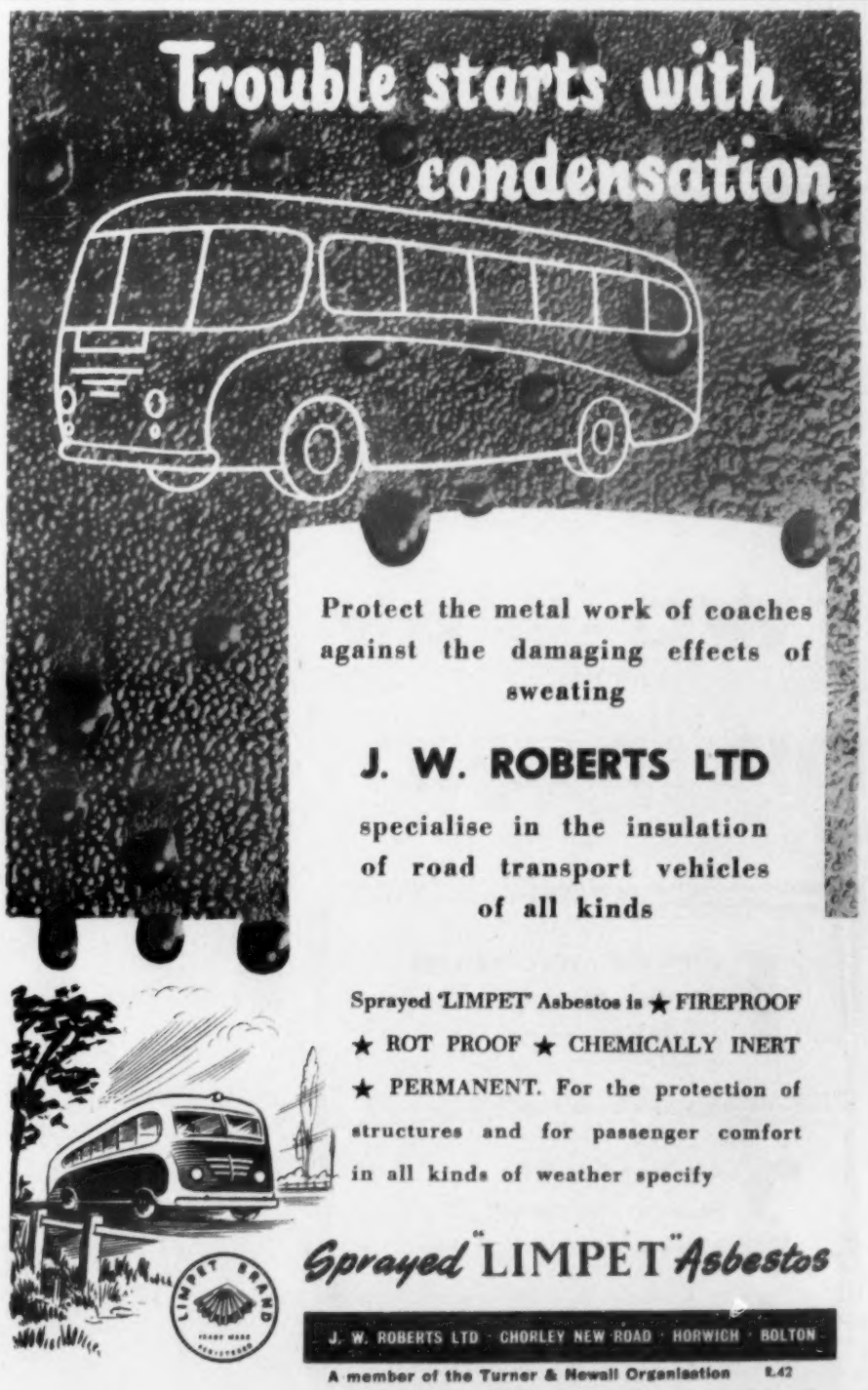

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ROAD HAULAGE IN ISRAEL

A Rural Co-operative

GALIL Maaravi—the name means Western Galilee—is a rural road-haulage co-operative in Israel serving its 13 member settlements in an area that is some 15 km. sq., and is bounded in the north by the Lebanese border and in the west by the sea. The centre of the area is the township of Nahariya, where the head office is situated.

The fleet of 18 vehicles is a very mixed one indeed—though not of choice—with individual carrying capacity varying from 6 to 30 tons. It comprises a Mack tractor, two GMC-engined White tractors adapted from lorry chassis cut down, five Macks, one GMC, one MAN, one Volvo, one Continental-engined Brockway—all diesel, and three Whites, two Brockways and an International; four of the vehicles are tippers. There are four semi-trailers for the tractors, and two four-wheeled trailers for the Macks. All vehicles stand in the open the year round in the settlements to which their drivers belong, the undertaking's garage being for repairs and maintenance only.

Owned by Settlements Served

The capital of the business is exclusively in the hands of its member settlements, which also provide the bulk of the work. Drivers and managers are nominated by the settlements from amongst their members for tours of duty of varying length, but are not wholly permanent. It should be added that the settlements are predominantly agricultural in character, and are all organised on co-operative or collective lines.

The relationship between settlements and the co-operative is a very special one. The former undertake to give the co-operative a monopoly on their haulage, and retain nothing heavier than a pick-up for domestic use. In return, it is obliged to perform all work ordered, and at the agreed rates fixed by the board. There are standard rates for tonnage, crates, cages, building materials, parcels and smalls, bananas in bulk, and for certain other classes of traffic. In addition there are rates for daily or hourly hire, and for passenger work. The co-operative also carries, but not exclusively and without obligation, for a number of enterprises in the area, but such work is at special rates and in competition with local owner-drivers.

Traffic

The bulk of the traffic is carried between the settlements and the Haifa area, and return, the distance varying from 35 to 50 km. Quite a considerable volume of traffic does, however, pass over much greater distances, the furthest point normally reached being Jerusalem, involving a round trip of some 400 km. On the Haifa line empty running one way is rare, but on the less frequent longer runs it is more difficult to balance outward and return traffic. Even so empty mileage represents quite a small percentage of the whole, but much of the work involves loading and unloading at a number of points.

Traffic is assorted. Commodities marketed include milk, fruit, vegetables and eggs—all in crates, live poultry in cages, sugar beet, bananas, peanuts, live fish from carp ponds—in removable tanks, livestock and grains. Inward traffic is no less diverse—fertilisers and feeding stuffs, empties for produce to be marketed, irrigation pipes, building materials, pesticides, groceries and general supplies all figure prominently. In addition there is "on site" work, such as hay and straw in bales from field to barn, farmyard manure to the fields, this latter loaded by a shoveldozer on the tippers, and passenger carrying, too, is an important item. The co-operative serves its members for visits to the theatre, concerts and exhibitions, and for sightseeing and tours. It should be mentioned that in Israel lorries convey much passenger or traffic that would pass by coach in England, special licences and insurance cover being required.

An American tractor trailer outfit hauling agricultural produce in West Galilee

Administration

Day-to-day running is in the hands of the operating-cum-general manager, assisted by the garage manager who also ranks as an executive, and by office and garage staff. Settlements order their requirements daily, and the rule is that all "normal" work ordered by mid-afternoon is performed the following day, if necessary with the help of sub-hiring.

Despite the short prevailing run, utilisation is quite good, the monthly running per vehicle being 3,000 to 4,000 km. according to season. Occasionally a monthly utilisation of 31 days is attained, the average for all vehicles being 24 to 26 days. Since every attempt is made to obviate empty run-

(*Continued on page 34*)

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The Rural Bus in Spain

(*Continued from page 13*)

four passengers screwed on to the roof. Steps were available at the rear to place luggage on the top and the hardy male passengers who used the open and exposed roof seats went up the same way.

Spanish-type Double-deckers

Gradually this primitive arrangement has grown into one of some elegance. The roof of the bus is still, as always, devoted to luggage in essentials, and is still approached by a rudimentary vertical staircase, but the enclosing of the front has gradually made the accommodation more luxurious. It is still generally used only by male travellers; the eye on tourist traffic, such as the Irun—Gijon service, via San Sebastian, Bilbao, Santander and Oviedo, a distance of 498 km. (roundly 310 miles), covered in 14¼ hours three times a week (daily, except Sundays, in summer) or the departures at 8 a.m. and 9 a.m. from Barcelona over the 37 miles to Monserrat, whence corresponding return journeys are made at 5.30 and 6.30 p.m.

Comprehensive Network

Long-distance routes that may be cited in various directions are Malaga—Algeciras, an 87-mile run covered in 3 hours twice daily; Algeciras—Cadiz,

Pegaso bus from Pamplona operated by La Estellesa S.A. entering Estella at 40 m.p.h.

situation is reminiscent of the mid-Victorian outlook on the use of the upper decks of London buses by women. Some in the hinterland of Bilbao have very elaborate covered tops over the forward half of the upper deck and the entire vehicle is brought within very low overall height dimensions. They pass freely under seemingly impossible archways and barriers, from their own garages to the canopies of filling stations and the occasional railway bridge. It has to be remembered also that the average rural bus station in Spain—and nearly every town of any pretensions to importance sports a bus station — has very low entrance doors for vehicles. A typical unit on a Leyland chassis, operated by Autobuses La Union, S.A., of Bilbao, on the service thence to Vitoria, has coachwork by Irizar of Ormaiztegui (Guipuzcoa) which seats 45 on the lower deck and 24 on the roof.

Pegaso with elaborate roof cover about to refuel in Vitoria

The bus has become extraordinarily popular among the rural population. It is usually somewhat faster—and quite often very much quicker than the local train services; running even on unsealed roads is comfortable and it has enabled the housewife to range widely from one market town to another in her search for purchases. The crews, as on rural buses at home, are the friends of all in the countryside they serve and the arrival of the bus in the village is as much an event as the arrival of the daily mixed train used to be. Many of the minor railways have fallen victims to the attractions of the bus—the electrified line up to 75 miles, twice daily in 3½ hours; Cadiz—Seville, 95 miles, once daily, also in 3½ hours; and Malaga—Seville, 130 miles in 7 hours three times a week. There are coaches over the 45 miles from Madrid to Toledo in 1½ hours three times daily and to Leon via Valladolid, a journey of 202 miles covered in 8 hours.

Salamanca is linked to Valladolid, 91 miles away, by buses at 8 a.m. and 5.30 p.m.; they take 3 hours on the journey. From Pamplona there are services to San Sebastian, 56 miles off, in 2 hours twice a day and to Bilbao via Vitoria (97½ miles) also twice daily, but owing to mountain roads slower than usual, as the average speed is round about 20 m.p.h. Barcelona to Lerida is a typical link bus service; it leaves Barcelona at 7.45 a.m. and the 99-mile run takes 4½ hours one way and 4¼ hours back.

The service from Tarragona to Tortosa is operated for RENFE, the Spanish National Railways, by La Hispano de Fuente En-Segures, S.A., with 40-seat ACLO buses supplied by the A.E.C. from Southall and mostly fitted with Tubus all-metal bodywork. There are 150 vehicles in the fleet, which originated at Benasal in Castellon in 1915 with a service from Benasal to Alcala. The undertaking now operates in the provinces of Castellon, Tarragona, Terisel and Valencia. Fares in 1957 varied between 0.28 and 0.4 pesetas a kilometre according to the concession. The Tarragona—Tortosa run of 92 km. (57½ miles) occupies 2½ hours; the average speed is thus 23.5 m.p.h.

Another vehicle of La Union S.A., a M.A.N. with half-covered roof and low overall height operating between Bilbao and Vitoria

Sanguesa, south of Pamplona, is one of these. In fact, the narrow-gauge station in Pamplona was by 1957 a sad sight, with neglected rolling stock lying where it had come to rest on the last day of operation.

Private Enterprise

Although carried out by private enterprise, services are strictly controlled by the authorities. The widest licence is taken in individualistic liveries and fleetnames. Among the latter "La Union" seems the most widely spread. But a vehicle based on such a town as Estella may be called "La Estellesa," or the proprietor may decide to place his own name on the side in flossy lettering. More likely, however, he will omit his name and paint brief route particulars instead. Town-service operators often feel no necessity for a distinctive name. The coverage across the country is most comprehensive and besides the trunk routes quite minor highways and the villages thereon are linked with the main centres by weekly and often daily services.

Some of the facilities are obviously run with an

The owner of the concessions for local service in Lerida (begun 1939) and Tarragona (since 1947) is Automoviles y Transportes, S.A., of Lerida, or ATSA. The fleet numbers 13, including Pegaso, Dodge, Mercedes and Isotta Fraschini chassis, all with Spanish bodies. Fares are on a mileage scale and headway 10 to 12 minutes on most routes.

Touring Facilities

Touring facilities are largely in the hands of the Government-sponsored A.T.E.S.A., or Autotransporte Turistico Espanol, S.A., but firms such as Autocars Pullman have a large private connection, working in conjunction with agencies such as Wagons-Lits-Cook. The Autotransporte Turistico company, formed a decade ago, is still functioning on the same lines as was originally intended, for the purpose of giving an exclusive touring transport service. This service includes both coaches and hire cars; it covers the whole of Spain, and if required, works in other European countries. When the company was formed, it appears there was no similar organisation in Spain.

(*Continued on page 33*)

Some of the Midland Motorways fleet of Leyland "Comet" buses operating in Christchurch, N.Z.
Midland Motorways operate 100% Leyland...

-and can you blame them?

Midland Motorways Services Ltd., Christchurch, N.Z., operate 42 Leyland buses and coaches covering 1¼ million miles per annum. They write to say "Frankly, we are amazed at the small amount of maintenance required to keep them in first-class trim . . . piston rings do not have to be replaced before 200,000 miles . . . we have not re-sleeved any of the diesels (one has already done 314,000 miles) and expect them to reach 350,000 miles before this work is carried out. Oil-fuel consumption for the 8½ ton buses averages 14.75 m.p.g. Your engineers are to be complimented on their wonderful workmanship".

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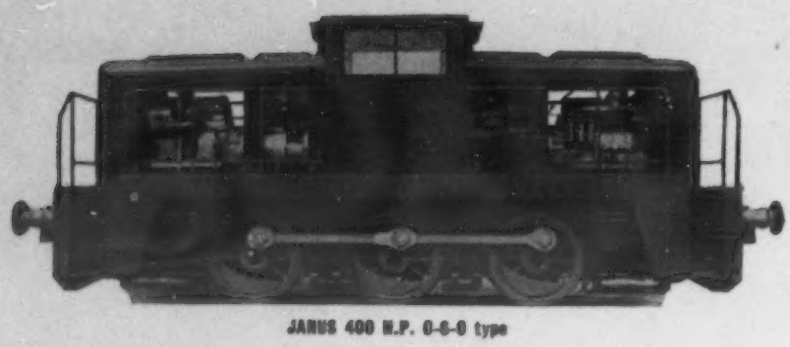
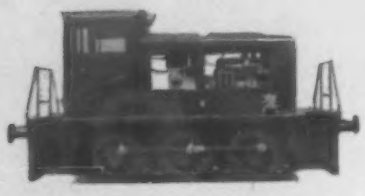
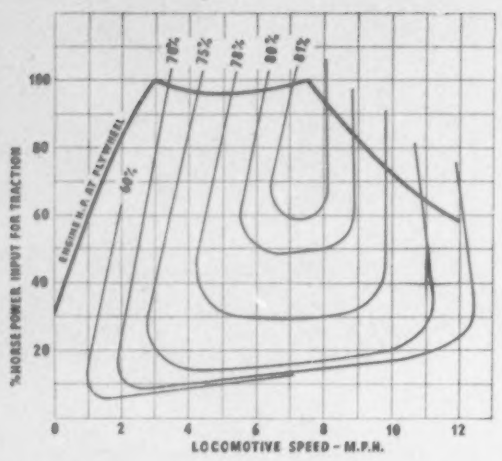


JANUS 400 H.P. 0-6-0 type

275 and 350 H.P. 0-4-0 and 0-6-0 types



200 H.P. 0-4-0 and 0-6-0 types



Yorkshire Engine Company has a comprehensive range of diesel-electric locomotives, and will be pleased to supply, on request, complete descriptions and specifications for any particular type.

Overall efficiency curves for diesel-electric transmission in use with these diesel-electric shunting locomotives illustrate the high part load efficiency obtained with this transmission. Efficiency exceeds 70% over practically the whole useful operating range of engine horsepower and locomotive speed.

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CZECHOSLOVAK TRANSPORT DEVELOPMENT

Considerable Expansion Anticipated

WITH a population density of some 270 per square mile and an advanced economy, Czechoslovakia has a close network of rail, road and air transport. There are roundly 9,000 miles (13,000 km.) of railway, 70,000 miles (120,000 km.) of road and 1,600 miles (2,500 km.) of air routes; in addition, some 250 miles (400 km.) of waterways (chiefly the Danube and Labe, better known in England as the Elbe) are in regular use. The postwar tempo of economic expansion has led, in the past 10 years, to an increase of 165 per cent in ton-km. transported, but it is the intention to increase the volume by another 90 per cent or so over the 1957 figure, between now and 1965. Looking further ahead, by 1970 rail transport should have increased by 202 per cent, as compared with 1955, and road transport by 256 per cent.

Rail and Road

This objective demands various further important developments. On the railways electric, diesel and gas turbine locomotives will replace steam altogether by 1970. Main lines, which account for 25 per cent of total but carry almost 60 per cent of trains, are to be electrified; and average speeds of goods and passenger trains are to be levelled up.

Road transport of goods has lagged behind rail and this is to be rectified by a better sharing of loads between the two systems. As a rule, it is intended that goods travelling less than 50 km. (or in some cases 100 km.) will go by road and those travelling farther by rail. Passenger transport by road is already well developed—buses, for instance, carried 965 million passengers last year—but will benefit by the introduction of new vehicles, such as Skoda RTO-type buses, in the coming year.

Air and Water

Air transport, also, is being expanded. The Czechoslovak civil airline, Ceskoslovenske Aerolinie, is just over 35 years old. In 1923 it carried the first 29 passengers; last year it carried 293,460 passengers and 8,221,370 kg. of freight. C.S.A. is currently being equipped with new IL-14 and Avia 14 planes, in addition to Tu104A turbojets for long-distance flights, and with Morava L-200 aerotaxis and HC-2 light helicopters for duties on internal routes. The volume of air transport in Czechoslovakia for one month is now greater than in the whole of 1937. At Ruzyně, Prague airport, there are about 120 movements of aircraft daily, and nearly 500,000 passengers and over 10,000 tons of freight passed through it last year. Work has begun on major redevelopment at Ruzyně; new runways will come into use in 1961 and by 1970 there will be new terminal buildings affording more than double present accommodation.

Water transport, as has been indicated, plays its part in the Czechoslovak network, chiefly along the lines of the Danube and the Labe-Odra. A number of canals, serving industrial centres, is now proposed as a series of supplementary internal links, and the projected Odra-Danube canal, which will cross Czechoslovak territory, will form another component in the future.

Merchant Navy

What is perhaps not realised is that, since 1952, Czechoslovakia has possessed a merchant navy. The present five ships are based on Polish ports (Gdynia and Szczecin) and mostly ply between Europe and the Far East. The fifth, completed a few months ago at Pula, Yugoslavia, is at present on her maiden voyage. Two other merchantmen, one of 13,000 tons, building at Osaka, Japan, and one of 3,200 tons, building at Varna, Bulgaria, are due to be delivered to the Cechofracht agency this year.

★

NEW L.M.R. FREIGHT DEPOTS

Work Already Started

WORK has already begun on the building of new sheds for London Midland Region outward goods sundries traffic at Manchester and Chester and on a new parcels depot at Oldham Clegg Street; these form part of the massive freight modernisation scheme announced by the L.M.R. only a month ago. Building of 13 similar depots in other parts of the region and at two marshalling yards will begin soon. In all some £5½ million is to be invested on these projects alone.

The Manchester Oldham Road terminal shed will provide covered accommodation for 132 wagons and Chester General 79. Each shed is of a simple standard steel design specially developed for the London Midland freight schemes giving maximum economy in cost and manpower and with a rapid erection time. The shed is to be of the open-sided type, with a protected metal roof covering and is asbestos sheeted down the sides to within 7 ft. of the ground. Adequate daylight is provided from suitably placed roof glazing. Facilities for vacuum testing for fitted brake wagons will be a feature.

Oldham Clegg Street

At Oldham Clegg Street the yard is being remodelled to provide a new parcels depot which will include decks for sorting and off-loading. The shed is similar in character and type to those at Manchester and Chester. New offices are being built alongside it.

[Oldham Clegg Street was one of the places indicated on the diagram in our February 7 issue at which there was to be participation by B.R.S. (Parcels), Limited, but it is understood that the latter has now withdrawn from this particular scheme.—Editor.]

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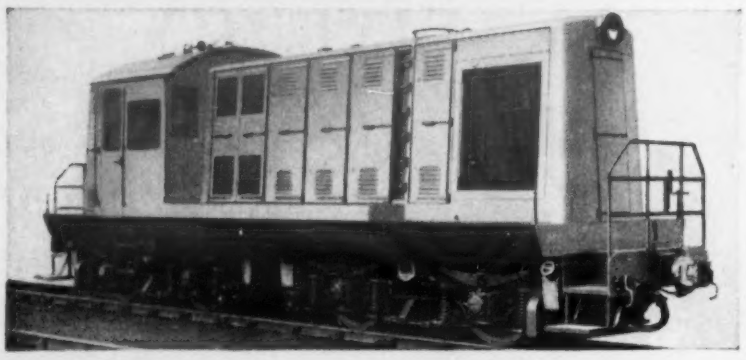
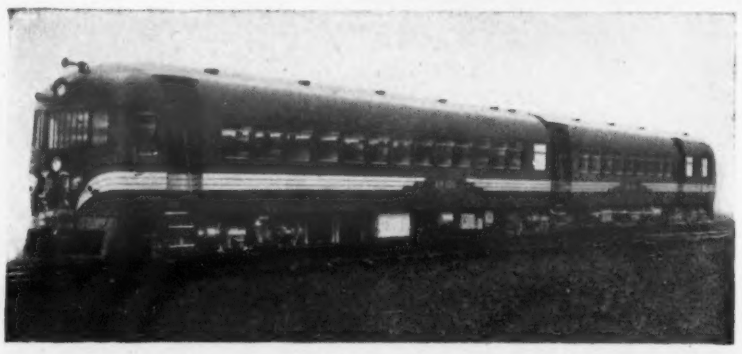


GHANA RAILWAYS
400 h.p. Diesel Electric Locomotive



NEW ZEALAND GOVERNMENT RAILWAYS
Twin Articulated Diesel Mechanical Railcars
In collaboration with The Drewry Car Co. Ltd.

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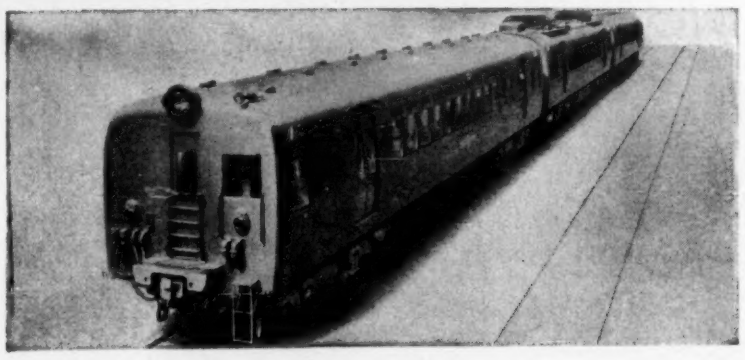
In collaboration with The English Electric Co. Ltd.



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HANDLING CARGO

Mechanical Aids in Ports and Ships

CONSIDERABLE ADVANTAGES

PIECEMEAL handling of the dock labour problem has placed the majority of British ports far behind world competitors. Review of progress by overseas harbour boards confirms that increased mechanisation will never be possible until existing labour conditions and port facilities in Britain are improved.

In the ten years from 1946, the tonnage of seaborne goods handled at the port of Rotterdam increased from eight million tons to around 72 million tons; in the same period the tonnage of sea-going vessels using the port increased from six million to 43 million. Part explanation of this remarkable progress is the increased use of mechanisation through the free enterprise initiative fostered by the port authority.

Measuring Work in Port

A yardstick to measure the working of a port is the tonnage of cargo worked per lineal foot; 250 tons is the usual capacity for a port. At Singapore, use of over 200 industrial trucks and small gangs keeps the figure at around 320 foot-tons. At Singapore, mechanisation was made possible by frequent labour drifts. Labour was not replaced: trucks were introduced. Gang strength was finally cut from 20 to five—with no objections from the unions.

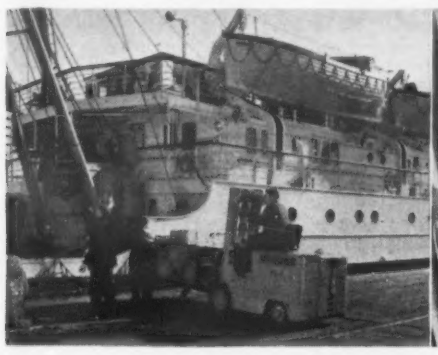
At the port of Bergen in Norway, mechanisation has halved turn-round times for ships. Palletisation and trucking permits loading and discharge of over 250 tons of general cargo in less than eight hours. Labour is paid on an hourly basis—gang strength being determined locally between management and employees. No restrictive practices prevail and labour relations are excellent.

Since the introduction of trucking at Newcastle's Tyne Commission Quay, hourly tonnage handled from Bergen and Fred Olsen vessels has been doubled. It is now possible to discharge as much as 18 tons per gang/hour, with an hourly average of 14 tons. Similar increases have occurred for Swedish Lloyd ships where about 400 tons of inward and outward cargo are handled each trip. Hourly tonnage figures for this application are 25 tons per gang—as compared with 10 to 12 previously. The highest figures for Swedish Lloyd ships so far achieved are: for discharging—40 tons per gang/hour, and for loading—47 tons per gang/hour.

Improved Turnround

Cargo ships earn no revenue while they are tied up to their berths. All they do is add to already high distribution costs. For each day in port a modern cargo liner loses £200 a day in unearned depreciation alone. On average, ocean-going ships spend only 45 per cent of their lives at sea, and short-sea traders are sailing under 40 per cent of their time. Ships thus spend longer loading and discharging cargo than in carrying it.

Increased mechanisation for the loading and discharging of Swedish Lloyd ships, trading from the Tyne to Scandinavia, now allows one vessel to do the work of two. Palletisation and trucking has reduced the time for Swedish Lloyd vessels at Gothenburg from five days to one. Discharging and loading in this country has been reduced from 1½ days to five hours. These savings mean that a round trip (Gothenburg—Leith—Newcastle) takes a week—as opposed to a fortnight before.



A Yale Series 51 6,000-lb. truck at Leith handling eggs on the short sea trade to Orkney and Shetland; right, a Worksaver pallet truck in the Netherlands ship "Koningen Emma" on the Harwich—Hook of Holland service

Union Attitude

In Britain, union leaders appear to accept mechanisation only as a supplement to the existing dock labour force. Port authorities and employers claim cuts in gang strength are the first way to justify increased mechanisation. Recently, as a result of recessions in world trade, labour surpluses at the docks are running as high as 15 per cent—intensifying resistance among dockers to mechanisation. A surplus of dockers and existing labour relationships forbid reductions in gangs—prohibit widespread introduction of materials handling equipment.

No one advocates the immediate disbandment of the National Dock Labour Board (although it would save the industry £5 million a year and create a healthier attitude between employer and employee); but the introduction of a pension scheme for dockers over 65 would immediately reduce labour numbers by removing the older element. By bargaining for a reduced labour force and smaller gangs in exchange for a pension scheme (long demanded by the unions) mechanisation could be speeded up.

Better Pay

This would make for a smaller but more skilled, more highly mechanised and better paid labour force—rescuing British ports from terrible manpower wastages and outmoded handling methods. As an example, use of Worksaver trucks for handling palletised cargo on Scandinavian ships in Newcastle has already increased dockers' earnings from 5s. to 10s. 10d. an hour, and the men are now paid the same amount for one day's work as they were previously getting for two. Trucking and palletisation of cargo by the North of Scotland Shipping Company at Leith has increased their dockers' hourly rate, through bonuses, by 3s. 6d. an hour.

Unitisation of cargo for fork-trucking guarantees men more work: pallets and containers are loaded and unloaded even when ships are not in port, and this levels peak work loads and stabilises employment. At Leith, 22 men work on a semi-permanent basis. In Newcastle, where similar conditions exist, 42 dockers, working Bergen Line ships, are employed on a weekly basis and are guaranteed minimum wage packets.

Increased Tonnage

Despite reports of this nature, port operations, where work is almost 100 per cent materials handling, have lagged behind current industrial mechanisation. Only in the movement of bulk cargoes, modernised in postwar years, have new handling systems been satisfactorily applied. Change was relatively easy here for two reasons: bulk cargo carriage has grown with many new terminals being built often away from established dock areas; and the labour force is far smaller than in the movement of general cargo. Great savings in time and transport costs have resulted. Iron ore, grain or coal is easily loaded into ships and sucked or grabbed out of them at a great rate —1,000 to 2,000 tons an hour. Britain's normal handling rate for general cargo (approximately 6-8 tons an hour per hatch) could be increased likewise with industrial trucks and other mechanical handling aids.

At Canadian Great Lakes ports, where trucking and palletisation are well advanced, 2,000 tons can be loaded in less than 12 hours: an average cargo handling rate of 166.6 tons an hour, the total number of men in the three holds being equivalent to the size of one British gang. Current working rates in Britain with the same gang strength would necessitate a loading time of 333 hours.

Time Halved

Turn-round times for ships of the Bergen line have been halved with 22-knot vessels now making two round trips a week. Before the advent of mechanisation, one round trip took five days. Quicker handling with modern materials handling equipment has permitted both the Swedish Lloyd and Bergen Lines to carry the same amount of cargo annually with one ship instead of two.

Recently, a case was cited where the use of industrial trucks, both on the quay and aboard ship, cut turn-round time from 48 hours to less than 12. An American coastal shipping firm was saved from the brink of bankruptcy by the introduction of Worksaver trucks on board ship and in warehouses, permitting the loading and discharge of up to 60 tons per hour and the completion of daily runs around its course as opposed to a three times a week cycle.

Mechanisation can reduce damage and handling costs for port authorities and stevedoring concerns. One shipping firm's claims adjuster reported that fork truck handling of unit loads had reduced the number of claims for cargo damage by 75 per cent. A well-known Dutch shipping firm effected a remarkable reduction in handling costs by the use of modern handling methods. During an eight-hour shift, one fork truck could handle an average of 80 tons. Formerly, this would have required 16 men. Analysis showed that, during a shift, handling costs were cut by approximately 6s. 8d. per ton.

In the Ship

What of mechanised handling in the ship itself? All manner of shore practices await greater exploitation on ships—conveyor belts, cargo lifts and industrial trucks could be used in vessels. Working surfaces usually deter from truck operation aboard ship unless the decks are flushed and hatch coamings have been done away with. Trucks are naturally not so mobile in a ship's hold but can be used in favourable conditions. Such equipment as powered or hand-operated pallet loaders can play an extremely useful part, particularly in the wings and ends of a ship's hold, transporting slings of cargo to and from the square of the hatch.

When it is considered what resources are marshalled by shipbuilders and marine engineers to reduce by the merest fraction the operating costs of a ship at sea, it is amazing how little concerted effort is put into reducing time in port. All in all, the mechanisation of British ports is an issue which is being discussed by many parties with various points of view. Co-ordination of those views will help to introduce increased mechanisation in Britain's ports bringing general benefits to ships, labour and trade.

Need to Experiment

Many shipping companies which for years have been trading regularly to a port are now attempting to centre their activities elsewhere. They are doing this because of costly ship delays and general inefficiency. Port authorities often answer their critics by pointing out what has been achieved in the way of making good war damage, and that they could achieve much more if "only labour would co-operate." Whilst this is to a very great extent correct, the problem facing many port authorities is not just a labour one.

A great deal has in fact been achieved with the co-operation of labour, particularly in the port of Manchester. Too many people responsible for port operation do not understand how to approach their problems, and attempt to introduce improvement without experiment. A careful exponent of mechanisation will first examine the particular traffic he wishes to mechanise and then make arrangements to hire the necessary equipment.

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Railway installations have been supplied for all parts of the world—the photograph shows a Metrovick Type 2—1200 h.p. Co-Bo Diesel electric locomotive for British Railways hauling a 420 ton train near Weatherby.

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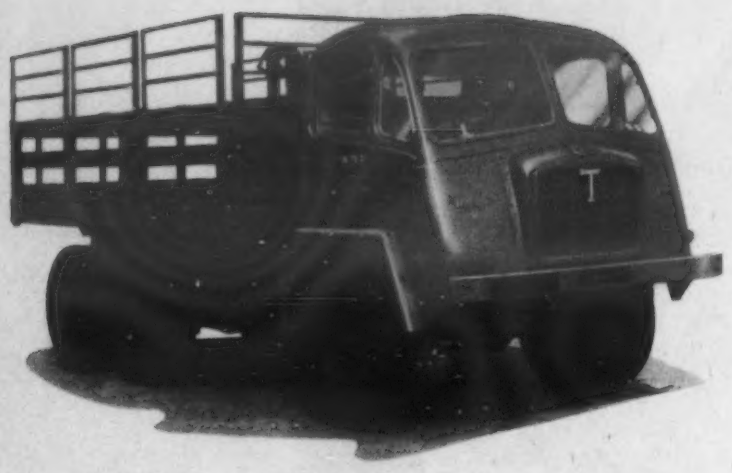

Open-sided truck on a "Nubian" 6 × 6 chassis for general purpose oilfield transport —Iraq

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TRANSPORT INFORMATION

Dissemination by Deccafax

AS part of the continuous study of means of improving the service of information to passengers, the Great Northern Line of the Eastern Region, in conjunction with Decca Radar, Limited, has arranged an experiment, lasting two months, using the Deccafax system, for passing train information from one central position at Kings Cross to the various points on the station which relay such information to the public. The Deccafax visual communication system, which has already been described in MODERN TRANSPORT, uses television principles, although no television camera is used. It was developed for air defence work and was first used by the U.S. Air Force in England. Subsequently Deccafax has been used in civil aviation and stock exchange work, but this is its first railway application.

Message having an addendum made to it by Chinagraph pencil on transparency in transmitter in Kings Cross signalbox; right, receiver in arrival indicator room

Hitherto, information on the running of main-line trains into Kings Cross, which is received in the signalbox from Peterborough, Hitchin and Hatfield, has been passed by telephone to the several station officials who need to receive it, e.g. the station announcer and the person in charge of the train arrival indicator. Using the Deccafax system, the information is passed visually to all receiving points simultaneously and the possibility of a garbled third hand telephone message is eliminated.

Equipment at Kings Cross

The equipment under trial consists of a transmitter in the signalbox and receivers located in the station announcer's office, at the train arrival indicator, in the inquiry office and the yard inspector's office. The transmitter employs the flying spot scanning technique. Messages for transmission are written by Chinagraph pencil on Cellophane sheets (transparencies) and placed on the screen. These are reproduced at the receiving points on standard television receiving equipment of the most suitable size. To avoid the need for anyone to watch the receivers continuously, a bell is rung from the transmitter whenever a fresh message is transmitted.

For the purpose of the present trial—at any rate at the outset—only messages in a stereotyped form are being transmitted. This permits the use of transparencies which have been pre-printed, leaving only the details of the message to be filled in by hand. There is no reason, however, why the system should not be used for messages of all kinds and it is confidently expected that experience will lead to other adaptations of it.

Possibilities

In particular, if certain technical difficulties can be overcome, e.g. the size of screen and the effect of daylight on legibility, it is felt that Deccafax or some similar system could be of great value to supplement loudspeaker announcements at busy stations. With the transmitter in the station announcer's office, for example, and receivers at platform barriers, and in waiting-rooms, buffets, etc., train and other information would reach to all parts of the station giving news to passengers who may miss the loudspeaker announcements. An obvious extension might be to the motive power depot where news of train running could be of great assistance in times of pressure.

It is hoped that the present trial will give valuable experience. We believe that the method has very considerable possibilities in transport service.

Prime Mover Conversion

OF MORRIS-COMMERCIAL 2-TONNER

RECENTLY a Morris-Commercial LCFO 2-ton chassis was converted by Taskers of Andover (1932), Limited, into a small type of prime mover, for which there appears to be an increasing demand. Fitted with a B.M.C. 3.4-litre diesel engine, it has been subjected to thorough examination by the Morris-Commercial design and engineering division, and it has its approval up to a maximum gross laden weight of 7 tons. It is designed to accommodate trailers fitted with the Tasker D.S. couplings and similar types of automatic gear. The conversion includes the fitting of a coachbuilt cab and shortening the wheelbase.

Special Features

Among the special features are power braking controlled by the footbrake on all six wheels and an independent trailer brake actuated by a finger-tip control lever fitted beneath the steering wheel. A power-operated, push-button trailer-release control is conveniently placed close to the driver's seat. As in normal practice with this application, stop lamp and brake connections are made automatically. The action of the locking mechanism is quite positive as the coupling hooks operate in a downward direction, completely securing the road rollers and preventing their accidental release.

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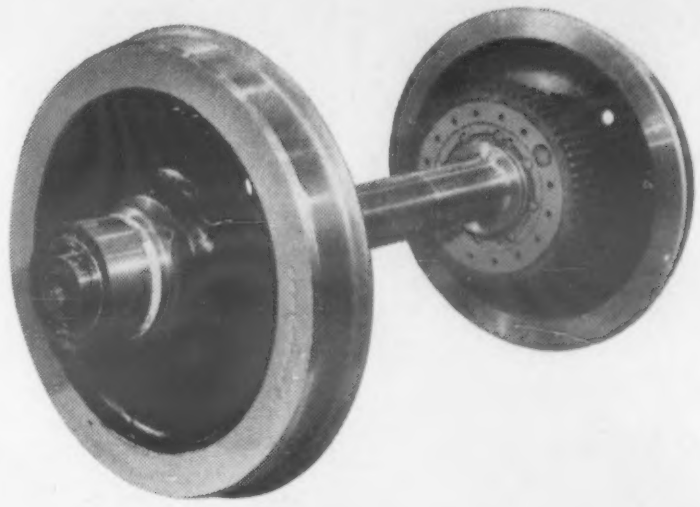

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The photograph, left, shows two 1,500 kW equipments. One of the two main transformers in the farther set is withdrawn to show its location.

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NEW SOUTH WALES TRANSPORT

Railway and Bus Operations

REPORTS are now available on two aspects of Government transport in New South Wales during 1957-58—the railway system and the Government Transport Department, which is responsible for the operation of road passenger services in Sydney and Newcastle. Both reports show favourable trends; the railways show higher levels of efficiency and the trams and buses of the State's two principal cities have lost less money per £ of revenue.

In submitting the annual report, the Commissioner for Railways, Mr. N. McCusker, said: "My gratitude is expressed to all members of the staff for their active contribution of faithful and efficient service during the past year." The report has been specifically designed to highlight for the trading and travelling public some of the achievements and progress made by the New South Wales Government Railways during the year in giving a better service. Although declining traffic volume has had an adverse effect on the overall results of railway operations, the department maintained or surpassed previous high records in significant operating averages which measure operational efficiency and economy.

An A.E.C. single-deck bus and one of the rear-entrance front-exit Leyland double-deckers characteristic of the Sydney scene; the last tram will run in 1962

Finance

The working expenditure for the year, which totalled £72,533,647, was £2,817,956 less than for the previous year. As this saving was achieved in addition to the absorption of uncontrollable increases in expenditure totalling over £1 million, economies effected in operations totalled approximately £4 million for the year. In addition, capital debt charges were £1,121,000 greater than in the previous year. Earnings for the year amounted to £74,432,599, representing a decrease of £4,256,003 compared with the year 1956-57.

Concessions allowed by the department amounted in total to £865,599. The concessions comprised passes issued to blind soldiers and their guides, transport of store stock, starving stock and fodder at reduced rates, rebates on freight to consignors of mill products, export flour, rice and canned fruit. The total capital expenditure on equipment and lines open for traffic was £270,912,375.

Modernisation

During the 12 months under review, the decrease in the stock of steam locomotives was offset by the increase in the number of electric and diesel-electric locomotives in commission. This has been consistent with the department's modernisation programme. Among the major works undertaken by the department was the erection of modern electric and diesel-electric locomotive depot at Enfield, with a capacity for 60 electric and 100 diesel-electric locomotives. This depot has been designed to provide for speedy and efficient inspection, servicing and maintenance of these types of locomotives. Work commenced on the electrification of the lines between Hornsby and Gosford. On this project the department estimates a net financial saving of approximately £720,000 per annum after allowing for interest and depreciation on the capital outlay of £3,841,500. Progress on the work is well ahead of schedule and the electrification was opened to Cowan on November 16, 1958. It is anticipated that the line will be completed to Gosford by the end of 1959.

Competition Continues

In the competitive field of transport it was evident that the New South Wales Railways continued to face stiff competition from both road and air transport.

Improvement of freight services, the development of new methods of freight handling, the expansion of departmental bulk loading system and increased use of commercial officers for the canvassing of new business are indicative of the department's endeavours in this field. The department is continuing to plan for the future in which full use is made of whatever new techniques and advances in technology will improve services and reduce costs.

Road Passenger Services

In his report on the work of the Department of Government Transport for New South Wales, Mr. A. A. Shoebridge, the Commissioner, says the highlight of the year's activities was the great success of the two major conversions from tram to bus in Sydney, resulting in abandonment of the tramways across Sydney Harbour Bridge and throughout the northern suburbs; in addition Pitt and Castlereagh Streets have been cleared of trams. A new bus depot at Tempe and enlargement of the one at Kingsgrove was necessary for the scheme on the south side, with another at Willoughby for services on the north side of the harbour. A central workshop costing £1,650,000 was completed at Chullora. During the year 134 underfloor-engined single-deck buses were delivered, making a total up to June 30, 1958, of 1,285 vehicles in satisfaction of orders placed since the war for 1,655 buses.

The loss at Newcastle, which averaged £300,000 a year for the five years ended June 30, 1956, was reduced in the 1957-58 period to £18,634. Some reduction of capital debt has been possible through the improved cash position. Trams were abandoned here in 1950 and this is considered the principal factor in the relatively better financial state. In Sydney the loss was 2s. 1d. per £ of income; this is more proportionately than was incurred in 1956-57, but much less than the 7s. 6d. of 1955-56 and the figures for the previous five years.

The operating expenditure was £160,550 less despite increases in wages, 1s. per gal. tax on oil fuel imposed in the autumn of 1957, increased superannuation and additional provision for depreciation and debt charges. The gross reduction of operating cost due to reduced tramway commitments and other economies was thus in the vicinity of £600,000. The number of passengers fell, however. As a result income totalled £13,820,740, a decrease of £439,053; expenditure totalled £15,267,818, a fall of £160,550; and the net loss of £1,447,078 represented a retrogression of £278,503.

One-man Operation

One-man bus operation has been expanded. In 1956-57 29.1 per cent of shifts were worked wholly or partly on one-man buses; in 1957-58, despite an increase from 26,873,000 to 29,398,000 in bus-miles run, one-man shifts rose to 31.7 per cent. In Newcastle the increase was from 30 to 32 per cent. The combined total of passengers was 310,087,000, a decrease of 14,206,000 or 14 per cent, showing a reduction in the rate of decline following the raising of fares in 1956. The extra revenue from higher fares fully justifies the loss of some passengers. Part of the recession can in any event be traced to the opening of regional shopping centres and expansion of all types of facilities in the suburbs. Night transport demand has decreased with the advent of television—this has been available some two years.

Since November 23, 1958, the tramway undertaking in Sydney is confined to services operating from Elizabeth Street in the central area to eastern and southern suburbs. Buses have been ordered for delivery to early 1961 and the final replacement of trams is anticipated by 1962.

TRADERS AND TRANSPORT

Mansion House Association Luncheon

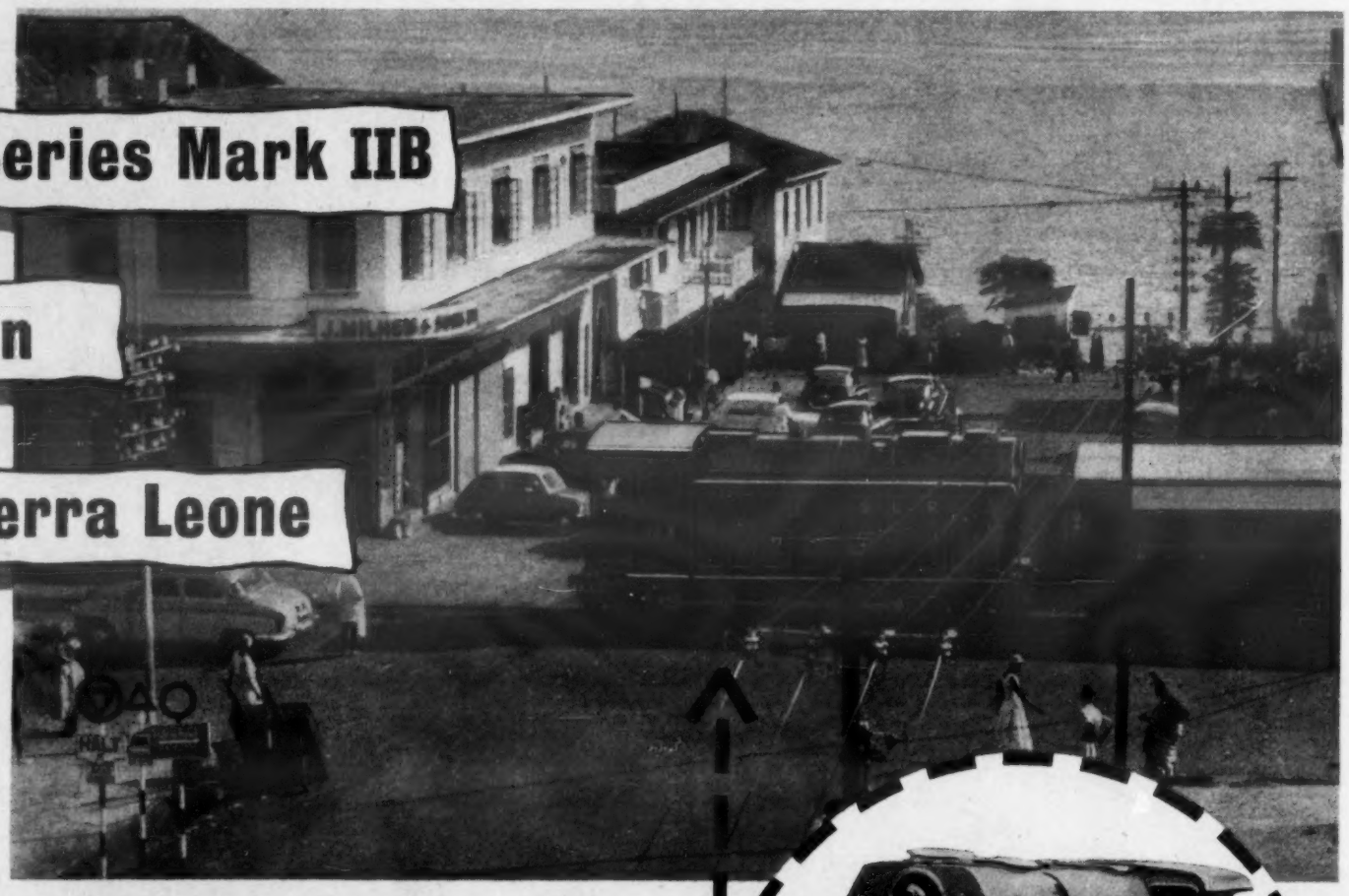
THE Mansion House Association on Transport has long tended to keep rather quiet about its activities. Not that they are dubious in any way but merely that it devotes its energies towards the benefit of its members and is satisfied with their appreciation. The annual luncheon in London is, however, a public occasion attended not only by members but also by distinguished guests connected Ministerially or vocationally with transport. This year's occasion on March 13 was presided over by Mr. M. F. Barnard, the president of the Association.

The toast of "Her Majesty's Ministers" was proposed by Mr. L. A. Carey, a vice-president, who, after wishing a long and happy retirement to Sir Gilmour Jenkins, Permanent Secretary, Ministry of Transport, went on to emphasise the wide range of interests which the M.H.A. covered. It was not, indeed it could not afford to be, biassed and its members were bound solely by the economic requirements of their undertakings. He was not unsympathetic as regards the plight of British Railways and as acting chairman of the East Anglian Transport Users Consultative Committee he was well aware of the problems which surrounded the Midland and Great Northern closure. The Association was suspicious of the selective increases in railway rates. It welcomed the new roads programme but wanted much more done to eliminate urban bottlenecks, while it thought restriction of loading and unloading anything but satisfactory. Action on the Bowes report on inland waterways was welcome and if the canals gave the right kind of service, they would be used. The M.H.A. was against anything that distorted the normal play of economics.

Transport Must be Flexible

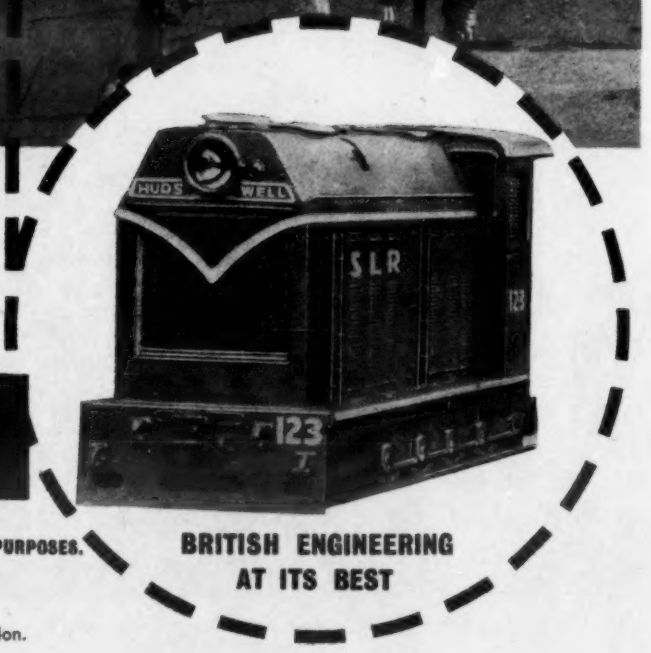
Replying to the toast, Mr. G. R. H. Nugent, Joint Parliamentary Secretary, Ministry of Transport, said he must make it clear that his sympathies lay with those who sought freedom of choice. Transport must be flexible but it must also be realised that the railways were essential to the country. Accepting this, it was undoubtedly right to provide the means for modernisation despite the deficit of £90 million. The railways had intensified freight competition and were, quite reasonably, fighting to hold their natural economic freights. No element of subsidy was involved and assuredly nobody wanted a subsidy of service.

Mr. S. J. Lamborn, member of council, proposed "The Guests" and Lord Derwent, chairman of the British Road Federation, replied. While congratulating the Minister and all his officials on the progress of new road works, he felt bound to point out that much had still to be done. It was not always appreciated that money lost due to traffic congestion could never be recovered. Anything done to prevent such waste gave a higher dividend on the money spent than any other action. Looking to the future it was absolutely vital that there should be a limited access ring road for London, with adequate parking facilities beside it. This might seem more like a dream, but Lord Derwent was certain of its necessity.



By courtesy of Davey, Paxman & Co. Ltd.

A Locomotive of the Enterprise series hauling a passenger train on the Sierra Leone Government Railway.
A total number of sixteen locomotives are being built for this railway, fitted with a Paxman hi-dyne (constant H.P.) diesel engine, Vulcan Sinclair dual fluidrive transmission unit, and a Final Reduction Gearbox by Bostock and Bramley.
The "Enterprise" series can now be supplied in horse powers up to 1,200.



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BOURNEMOUTH BUS STATION

Transformation Completed

EXCELLENT FACILITIES FOR TRAVELLERS

WHAT may confidently be hailed as Britain's finest provincial bus and coach terminal is now in full working order in Bournemouth. It is the Hants and Dorset station in The Square, barely recognisable in its rebuilt and greatly enlarged form. This is the station which was originally built in 1931 and even then was a model for others to aspire to. Now the magnificent view from offices and the public restaurant out over The Square and its gardens, quite apart from the excellence of its passenger handling facilities, puts it right out in front again. The station provides accommodation for Hants and Dorset bus services and also for Royal Blue express services and terminal facilities for other associated companies and constitutes an important improvement in transport amenities for thousands of local residents and holiday visitors who travel in and out of the borough each day. A description of these operations and a history of the station appeared in our December 7, 1957, issue. There is now covered platform accommodation for over 2,500 passengers and garage and parking space for 109 buses and coaches. All departures are under cover. On a typical day in the peak holiday season the station will be used by nearly 80,000 passengers and there will be 2,200 service arrivals and departures.

This is how the rebuilt Hants and Dorset bus station looks from Bournemouth Square; right, the bus station from the rear of the site, showing coach and service bay exits

History of Site

It will be recalled that the original bus station on this site was constructed in 1931 and consisted of a two-storey building, the upper floor being used by the Hants and Dorset and the lower floor or basement by Royal Blue Services. Owing to a considerable increase in traffic, it became necessary in 1935 to purchase some land at the rear of the building with frontages in Exeter Road, Exeter Lane and Pavilion Road, and about three-quarters of the site was levelled for use by the Hants and Dorset as an additional operating area. It gradually became the main station, and pressure of traffic made the original building little more than a covered entrance. The ramp leading up on to the bus station level is no longer used, buses entering and leaving via Exeter Road.

Under the scheme just completed it was decided to develop the land to enable two bus garages at St. Michaels Road and Norwich Avenue to be closed and all operations centralised at The Square. The closure of these two garages, which are half a mile away from the main station, has eliminated much empty mileage and duplication of control with a consequent saving in operating costs. The scheme also provided for the removal of the head office of the company from Bath Road to The Square so as to achieve complete central administration. Two floors have, therefore, been added to the original building, the lower of which accommodates the Hants and Dorset and Royal Blue depot administration and garage staff as well as a staff canteen, while on the upper floor is the head office. Major repairs are now done at Parkstone.

The ground floor of the office block comprises a spacious booking hall; parcels, left luggage, lost property and inquiry offices; toilet facilities and an up-to-date public restaurant and self-service cafeteria overlooking the Central Gardens.

Work on the new building began in March, 1957; a major requirement being that all services should be kept operating during alterations. To enlarge the operating area of Royal Blue Services, approximately two-thirds of the site at the rear of the original building was excavated, necessitating the removal of some 30,000 cu. yd. of material. This area is now equipped with secondary booking and inquiry offices, a covered passenger platform and public lavatories. Above, a concrete platform was introduced supported on steelwork to provide a bus station and layover area for Hants and Dorset. This has a covered passenger platform around its whole perimeter, and an elevated control office for the regulation of traffic. The facilities in this area include a newspaper, cigarette and confectionery kiosk, and public lavatories and telephone boxes are provided.

A maintenance bay for Hants and Dorset vehicles, with washing and servicing facilities, has been provided adjacent to the Royal Blue station on the lower level, with access from Exeter Lane. The local authority, in conjunction with the company, widened and improved Exeter Lane and Pavilion Road to provide the necessary gradients for the movement of vehicles to and from the maintenance bay and the Royal Blue station. In the original building, the Royal Blue vehicles entered and left by means of two ramps.

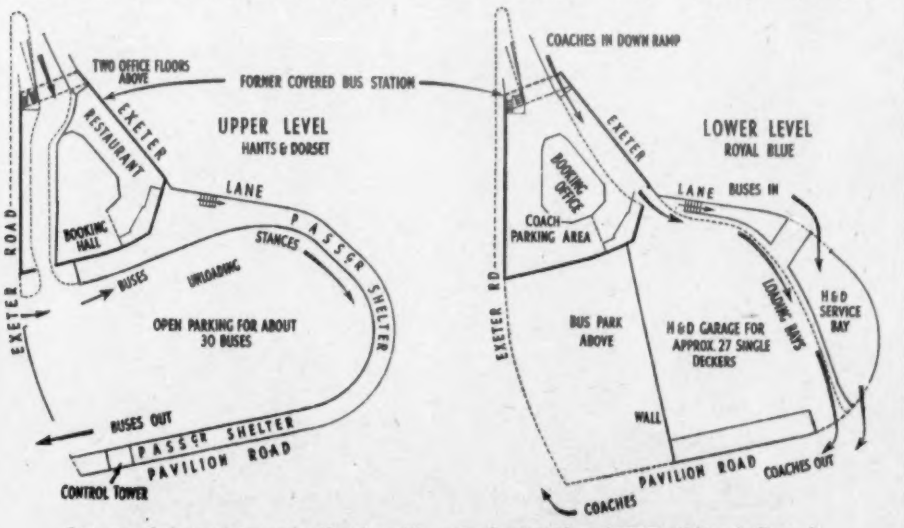
The main booking and inquiry hall; right, the coach station on the lower level with stairs to bus station

The new layout does away with the exit ramp and permits vehicles to enter from The Square and leave by way of Pavilion Road, thus making it possible to avoid The Square on the outward route. The total cost of the new work has been approximately £300,000.

Inaugural Luncheon

To mark the completion of the rebuilding and enlargement of the station there was inaugural inspection last week, attended by the Mayors of Bournemouth, Christchurch and Poole—Councillor H. Brown, J.P., Alderman J. W. Richardson and Alderman A. N. Butler, followed by a luncheon in the Carlton Hotel. Other principal guests, among a fully representative gathering, were the chairmen of the South Eastern and Western area Traffic Commissioners, Messrs. H. J. Thom and S. W. Nelson, respectively, Mr. R. I. H. Longman, chairman of Hants and Dorset Motor Services, Limited, who presided at lunch accompanied by Mr. S. Kennedy, chairman of the Tilling Group, and all the directors of Hants and Dorset.

Proposing the toast "The Guests," Mr. Longman suggested that the time had come for a revision of the 1935 agreement between Hants and Dorset and Bournemouth Corporation. He hoped his management could get together with the Corporation transport department in sorting out the prohibition of picking up and setting down on certain services. Hants and Dorset buses were wasting mileage through running five miles each way at the beginning and end of their journeys without being able to pick up or set down.



Layout of the two operating levels, with area of original enclosed building indicated

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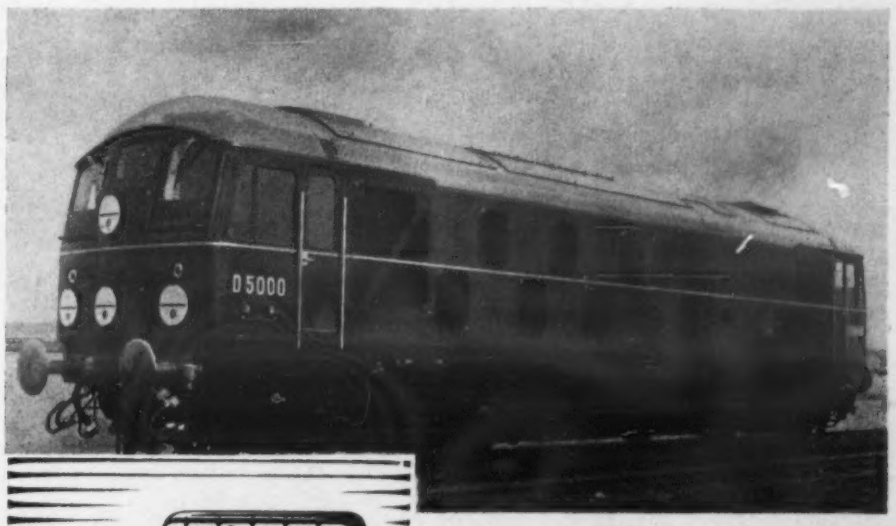

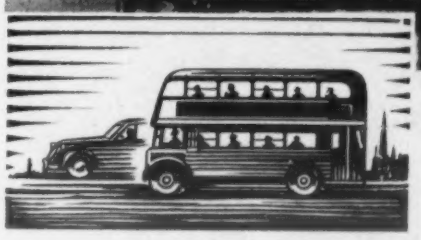

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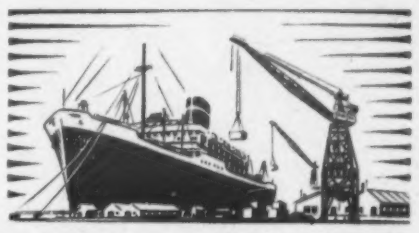

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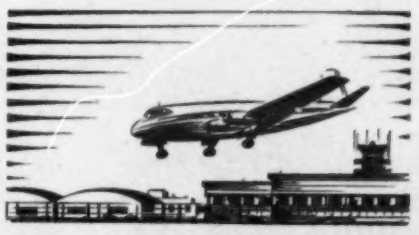

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INDIAN RAIL AND ROAD PROGRAMME

Substantial New Construction

IN his 1959-60 budget the Indian Minister for Railways makes further provision for modernisation and extension. A loan of 90 million dollars by the World Bank is coupled with the promise of a further 85 million dollars in the future; a loan of 40 million dollars is being obtained from the United States Development Fund; there is another of 35 million dollars from the same source; a U.S. loan of 20 million dollars for the extension of the ore depots in the state of Orissa; and one of 8 million dollars from Japan for the same project.

Profit and Traffic Increase

The Indian Railways will realise a profit of 210 million rupees on 1959-60 operations with a revenue of 4,220 million rupees. Goods transport by rail amounted to 140 million tons in 1958-59, and in the current financial year, as a result particularly of the opening of three large steel-works in India, an increase of 14 million tons is anticipated.

The Deputy Minister for Railways, Shah Nawaz Khan, told the Indian Parliament in New Delhi at the beginning of March that an order for 110 electric locomotives had been placed with overseas suppliers. The first 10 of these would be delivered in parts and assembled at the national locomotive works at Chittaranjan. It was foreseen that this plant would start building its own electric locomotives at some time in the future, after it had been supplied with the necessary units by the nationalised plant for electrical machinery now being built in Bhopal. Three Indian companies, Tata Locomotive and Engineering, Textile Machinery Corporation and Hindustan Motors, have been given the task by the Government of working out, together with foreign firms acting in an advisory capacity, which include a French consortium, the designs for the first electric locomotives to be made at the Chittaranjan works.

Developments

The management of Indian Railways is at work on a vast expansion programme which is employing 750,000 engineering personnel. The cost of the works concerned is estimated at Rs. 1,125 crores and the staff involved covers civil, mechanical, electrical, signal and telecommunication engineers supported by stores, research and design experts. Much of this work has to be completed in order to move the budgeted 150 million tons of freight traffic by 1960-61 as well as increasing passenger traffic.

Work is in progress on more than 700 miles of new lines, 1,200 miles of doubling and the remodelling of 50 major yards, 12 of which will cost about Rs. 100 to Rs. 300 lakhs each. Some 200 new stations are being opened all over India and additional traffic facilities and passenger amenities provided at 500 other stations. For lower-grade staff 65,000 quarters are being built. Major bridges under construction are the 6,000-ft. long Ganga Bridge at Mokameh and the 2,000-ft. Gandak Bridge at Sonepur. Some 2,500 million cu. ft. of earth has to be moved and 12,000 miles of permanent way (including track renewals) has to be laid. No fewer than 6,000 bridges have to be renewed on existing routes or built on the new lines.

Rolling Stock

To carry the anticipated increased traffic additions to rolling stock will comprise 919 locomotives, 33,395 wagons and 5,128 passenger coaches. To meet the increased maintenance demand consequent upon the growth of rolling stock, six new workshops are being constructed, 20 existing workshops extended and 34 new locomotive sheds built. To deal with the increased traffic heavier and longer trains will be run. It is intended to make a changeover to centre buffer couplings.

Electricity will be laid on at 900 stations which will be provided with such amenities as electric fans. Fans are also to be provided in third-class compartments; another amenity will be improved lighting in passenger coaches. Some 1,450 route miles of railway are to be electrified; most of this is on the Eastern and South Eastern Railways, in the coal and steel area.

Signalling

Improvements to signalling are a prominent feature in the new developments. Provision has been made for interlocking 300 additional stations and for re-signalling nearly 800 others. Route relay interlocking is shortly to be introduced at Kurla (Central Railway, near Bombay) and is proposed for Howrah (Calcutta), Delhi and in the Madras area. Telecommunication facilities are being improved by the installation of new telephone exchanges, teleprinter services, v.h.f. radio-telephones between important stations and the replacement of manual by automatic exchanges.

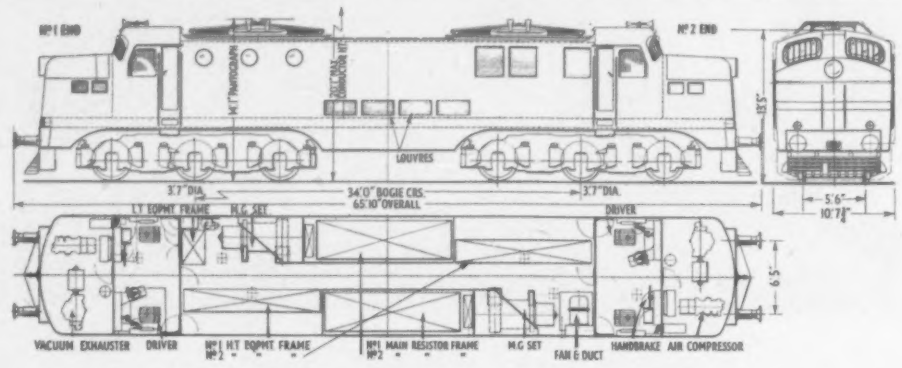
The execution of all this work depends on the prompt delivery of stores, running into many thousands of items. More than 75 per cent of the stores required will be obtained in India. The major items consist of 5½ million tons of steel and 2½ million tons of cement.

Manufacture of wagons in India has increased from 3,700 in 1951-52 to 16,000 in 1957-58. The present output of coaches is about 1,200 as against 700 in 1951-52. A total of 27 steam locomotives were built in 1051-52 and 258 in 1957-58. The Indian Railways system is making every endeavour to increase indigenous production of locomotives, rolling stock, signalling and interlocking equipment and electrical apparatus.

Indian Road Plan

The Indian Roads Congress met for its 23rd session in Hyderabad in January. Mr. Nehru, in a message to the session, expressed the hope that the Congress would try to devise a means of using local material for the construction of innumerable village roads. A new road plan, finalised by the Ministry of Transport and Communications, was discussed; it provides for raising the total mileage to about 657,000. In terms of areas served the road mileage will increase from 0.26 to 0.52 miles per square mile of territory by 1981. The corresponding present-day mileages for some of the other countries of the world are: 3.26 for Great Britain, 4.30 for France, 1.00 for U.S.A., 0.80 for Ceylon, 0.38 for Spain and 0.18 for Australia. In terms of population, the road mileage in India at present is 83 miles per 100,000 of the population as against 379 miles for Great Britain, 2,090 for France, 1,772 miles for U.S.A., and 283 miles for Ceylon.

The new plan represents India's minimum needs. Its objective is to bring every village (i) in the developed agricultural area within three miles of a metalled road and 1.5 miles of any road; (ii) in a semi-agricultural area within about five miles of metalled roads and three miles of any road; and (iii) in a non-agricultural area within nine miles of a metalled road and five miles of any road. The Nagpur plan of road development, which was formulated in 1943, provided for a total mileage at the end of 20 years of some 331,000 miles at a cost of Rs. 7,450 million approx., at today's price.



Elevation and plan drawings of the English Electric 3,000-volt 3,120 h.p. locomotive for Eastern Railway of India

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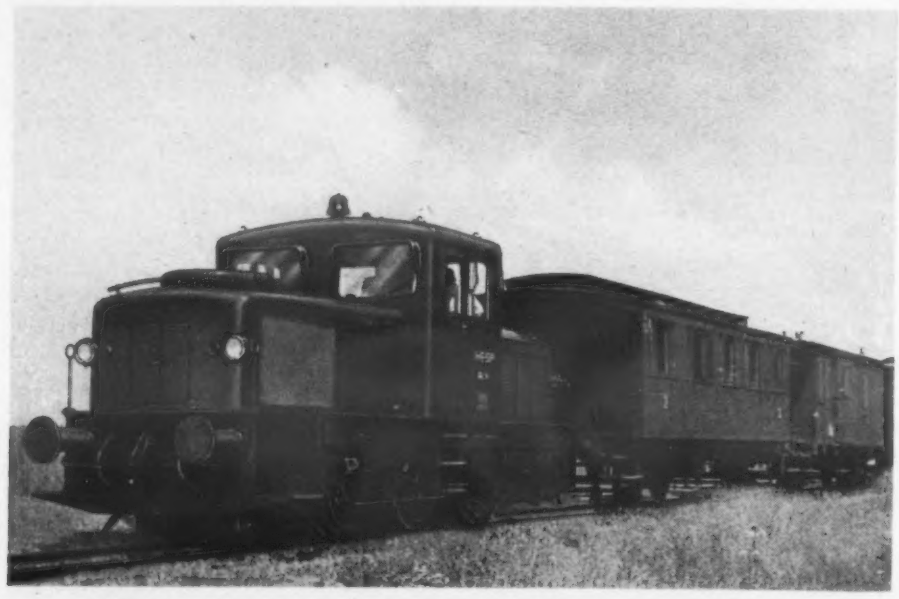
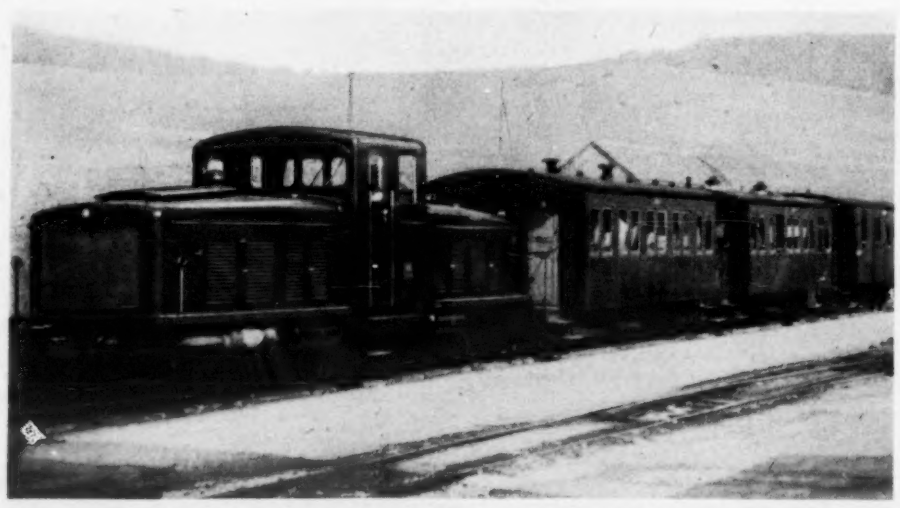


JUNG 440 h.p. Diesel-hydraulic locomotive, three-axled, with central driving cab.

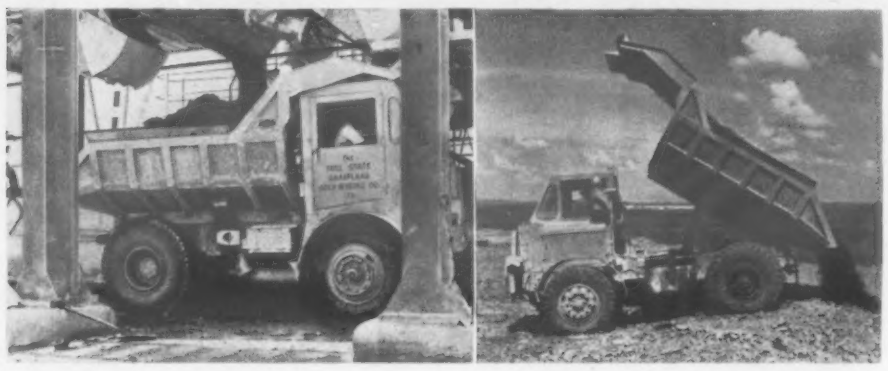


JUNG 480 h.p. Diesel-hydraulic articulated locomotive with 2 two-axled driving bogies and central driving cab with three-point suspension. Gauge 1000/1067 mm.

MINE SHAFT SINKING

Foden Dump Trucks in Record

AN enormous stimulus to the development and prosperity of South Africa was given by the discovery of the Rand goldfield in 1886; there may be even more potentialities in the discovery of uranium in the Witwatersrand in 1945. Here it is found in a pyrite bearing quartz pebble conglomerate as a byproduct of gold mining—very different from the pitchblende uranium ore of Canada and the Belgian Congo. Last year 28 mines on the Witwatersrand alone produced uranium worth £50 million. When capital costs were lower it was usual to bring a gold mine into production only after sufficient ore reserves had been developed. Today it may cost £13 million to bring a mine to the production stage and the huge increase in production costs has made it imperative to get revenue as early as possible from the venture. As a result a premium has been put on the value of rapid shaft sinking.



Three Foden dump trucks helped to break the world record for shaft sinking in an Orange Free State gold mine

A new goldfield was opened up in the Orange Free State with the grant of a lease to New Consolidated Gold Fields, Limited, of Johannesburg, in 1955; a mine north of Harmony and east of President Steyn is operated by a subsidiary, the Free State Saaiplaas Gold Mining Co., Limited. The consulting mechanical and electrical engineer to the group is Mr. L. T. Campbell-Pitt and his congratulations to Mr. Harold Hymans, director of Fodens (South Africa) Pty., Limited, called attention to the stout work of three Foden Dump Trucks used on the shaft-sinking job. The No. 2 shaft was sunk 834 ft. and lined for 810 ft. in one month and the speed of the operation is attributed to the service of the Foden fleet, which shifted 51,900 short tons during the same period—thereby making a record.

The Free State Saaiplaas mine is the first venture by the New Consolidated group in the area; it was not expected to cut through the reef until the close of last year. The shafts will have an exceptionally good hoisting capacity of over 200,000 tons a month when they are finished. During the past decade 11 of the 12 mines originally planned on the Orange Free State goldfield have been brought to the production stage. In that time 27 shafts have been sunk to a total depth of 22 miles; there are 430 miles of tunnels in the goldfield. Water is pumped out of the workings at the rate of 4,000 million gallons a year; the weight pumped in 1955 was 22 million tons—or three times the weight of ore crushed that year.

The new goldfield has livened up this part of the Free State and enhanced its prosperity. In all this the firm of Fodens may well feel some vicarious pride. The 6 cu. yd. dump trucks eat up the biggest problems in local mine transport. If the fleet depicted in these brief notes is insufficient to do the job then the star of the Foden range must be called upon—this is the 18 cu. yd. dump truck for 28-ton loads powered by a Rolls-Royce 300-h.p. diesel engine. This FR 6/45 unit was described recently in our columns.

Rural Buses in Spain

(*Continued from page 25*)

Suggestions made earlier for the formation of a coach-operating company among existing private companies or investors did not meet with a favourable response, as at the time no foreseeable future lay in the tourist trade. However, the government gave the company its backing. In financing the company, it was proposed that private investors would at any time be able to take up holdings in the company, with the view to its being financed and run by private enterprise ultimately.

Two types of ATESA vehicle for coach excursions: a 10-seat Renault with French bodywork by Amiot Dinan and, right, a 40-seat Büssing underfloor engine coach in Madrid

Founded in 1949, by the National Institute of Industry, the company now has a total of 50 coaches and nearly 200 cars. Headquarters of ATESA are located in Madrid; other centres are based on Barcelona, San Sebastian and Algeciras. Popularity of coach touring in Spain, and beyond, has gradually increased; a total of nearly 55,000 passengers were carried by the company in 1957 on coach tours and excursions. Well in excess of 5,000 people used its car services.

The fleet owned and operated by ATESA is varied and includes Pegaso, a product of the Spanish vehicle industry, Leyland, Büssing, Renault, O.M. Saurer and Mercedes. Seating capacities vary from 10 to 40 seats. Bodywork of the coaches has been built in Spain, France and Germany. The Pegaso coaches operated are of observation type, seating seven passengers on the lower portion and 24 on the upper deck. For these the bodywork is by Sirie, one of the noted Spanish coachbuilders. Coachwork of the Büssing fleet is German; seating capacities are 22, 36 and 40, and of these, the 22-seat coach is equipped with bar and toilet, this vehicle being intended to give maximum luxury comfort for the longer distance tours. Amiot Dinan of France built the bodywork of the Renault coaches which have seating capacities of 17 and 10. Livery is blue and silver.

In addition to the many scheduled sightseeing excursions and tours, there are facilities for hiring coaches by individual parties. With private hires it is stipulated that a minimum of 100 kilometres is to be travelled in one day; in the case of weekly hire this is reduced to 75 kilometres a day. Roundly 2s. 6d. a kilometre is charged for 36- or 40-seat coaches; in addition there is a supplementary charge of 27s. 6d. a day, to cover driver's allowance, garage, etc. For any journey outside Spain, there is also a supplementary charge of £3.

Fleets are usually very varied in content, but the Spanish-built Pegaso is gaining in popularity, especially since the association of the know-how of Leyland Motors, Limited, with the Pegaso product. When fitting its own engines the Pegaso organisation favoured a six-cylinder 9.3-litre engine of 140 h.p. A typical single-deck vehicle 32 ft. 9 in. long weighed 5¼ tons and could operate comfortably on the road at 55 m.p.h.

An A.E.C. (ACLO) coach operated by Hispano Fuerto en Segures of Tarragona seen on hire to RENFE for service between Tarragona and Tortosa

"A most satisfactory petrol-to-diesel conversion"

. . . . writes Mr. H. G. Burkett, Works Manager, Coventry & Jeffs Ltd., Perkins Signholders, Bristol, who operate a 10/15 cwt. Bedford C.A. Van powered by a Perkins Four 99(V) diesel engine.

This van is attracting a lot of interest and attention Bristol way during the course of its travels for the Company in carrying stores spares to various centres.

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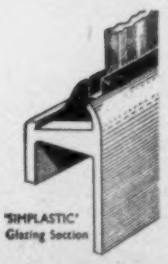

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LONDON BUS CONVERSION

For Right-Hand Running

AT the end of 1958 a London Transport bus, RTL3, was converted to have an offside staircase and platform to make it suitable for running in countries where the rule of the road is right-hand running. The conversion has been made so as to see how it could be most advantageously carried out should a substantial number of vehicles be sold overseas to a customer that desired the conversion. A number of buses is surplus to requirements owing to reductions in density of services following the bus strike of 1958.

With inappropriate blinds this view shows the modifications to London Transport Leyland double-decker RTL3 for right-hand running

The rear entrance and staircase of this bus have been completely reversed, so that the entrance is now, by United Kingdom standards, on the offside. The work involved the complete removal of the original staircase and platform, together with associated items such as the battery crate and riser, conductor's ticket locker, starting bell, handrails, etc. A new design of staircase has been fitted, giving a right-hand spiral ascent. Many of the component parts of the original staircase are capable of being used by employing them mirror-wise. Associated work included the cutting of a stair well in the intermediate floor and making good the space previously used, the reinstallation of the rear seat on the upper deck, and the fitting of a fender panel and framing to protect the stairs. The platform riser has been modified and a new platform installed giving a drain-off slope to the opposite side of the vehicle.

The rear frame has been modified to accept rear lighting and registration number plate on the opposite side of the vehicle, and the battery crate and battery are installed under the new staircase. Electrical connections are provided as necessary for platform lighting, the starting bell, and rear lighting. The entrance to the lower saloon also needed alteration to give a blank panel on the staircase side and a window and window pan on the entrance side. The position of the handrails has also been changed to suit the new layout. The only chassis modification found to be required was the reversal of the tailpipe to exhaust on the opposite side of the vehicle.

The modifications were carried out by London Transport engineers to the requirements of Mr. A. A. M. Durrant, chief mechanical engineer (road services), and at the request of Mr. E. C. Ottaway, chief supplies and services officer, London Transport.

★

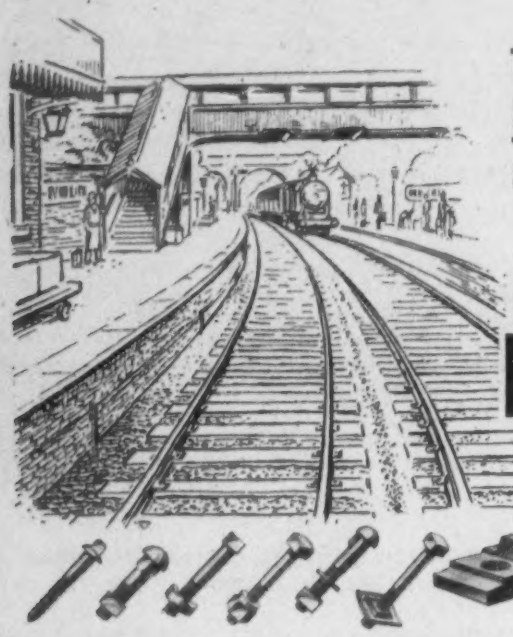
ROAD HAULAGE IN ISRAEL

(*Continued from page 24*)

ning, drivers work long hours, often rounding off a full day of general haulage with an evening run of produce to market, returning with a load of empties in the small hours. The fact that all periodical docking and major repairs are undertaken by the garage helps greatly in achieving the high factor of availability that the above figures reveal. When capacity is spare, the garage also carries out repairs for local customers. Although the summer season is busier than the winter one, the latter is far from being dead, traffic in the peak months being less than twice that in the slackest, despite the prevailingly agricultural nature of the work. Nevertheless, at the height of the summer season, the strain is considerable, and often demands much sub-hiring at unfavourable rates.

Prospects

As all the settlements are continually intensifying their methods and increasing their production, traffic is perpetually on the increase, to which the growth of the population and industry of Nahariya adds its share. The co-operative has grown in the past seven years to its present size, having been founded by a handful of settlements who agreed to pool their lorries. As the expansion referred to above brings more traffic, and as more settlements join, the undertaking will be able further to rationalise and improve its methods. In the period of growth ahead, completion of dieselisation, milk haulage in tankers and maximum of traffic in full lorry loads will rank high amongst its aims.



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SOCIAL AND PERSONAL

The late Mr. Alex Fraser

WE greatly regret to record the death, at the age of 65, of Mr. Alex Fraser, former vice-chairman and general manager of Girling, Limited. Mr. Fraser joined New Hudson, Limited — later Girling, Limited — as assistant works manager in 1926. He later became general manager, then a director and in 1943 vice-chairman and managing director. He retired from the company during 1957. It was Mr. Fraser who recognised the potentialities of Captain A. H. Girling's mechanical brake nearly 30 years ago and persuaded New Hudson to produce them. He was also associated with the development of disc brakes and with pioneering the first all-British hydraulic power-assisted steering for private cars.

* * *

Mr. A. L. Lanckton has been appointed a director of the Mobil Oil Co., Limited, in place of Mr. J. C. Dean, who has resigned.

* * *

Mr. H. G. Stage and Mr. F. Tompkins have been appointed directors of Nu-Swift, Limited. Mr. Stage has been oversea marketing manager since 1952; Mr. Tompkins has been home sales manager since 1954.

* * *

F. Perkins, Limited, announces the appointment of two new directors. They are Mr. J. G. Dawson, B.Sc., M.I.Mech.E., director of engineering, and Mr. Geoffrey Smith, A.M.I.Mech.E., A.M.I.E.E., director of production.

* * *

Mr. W. J. G. Hawkins, M.I.N.A., a Deputy Chief Ship Surveyor of the Ministry of Transport, has been appointed Principal Sea Transport Surveyor with effect from April 1 in succession to Mr. H. H. Bath, B.Sc., M.I.N.A., who is retiring.

* * *

There are now 168 employees of East Yorkshire Motor Services, Limited, who have been with the company for at least 25 years. Handing over the latest awards to 15 men at a presentation dinner in Hull, Mr. A. F. R. Carling, managing director, described the long-service personnel as being the backbone of the company.

* * *

Mr. N. G. Bennett has been elected a joint managing director of Graviner Manufacturing Co., Limited, fire protection equipment manufacturers. After service with the Air Ministry in its accidents investigation branch, he joined Graviner in 1946 and was made chief engineer and elected to a seat on the board in 1947.

M.o.T. Appointment

THE Minister of Transport has appointed Mr. J. E. Hampson to be a Deputy Secretary with effect from April 1. Mr. Hampson will take charge of the inland transport part of the Ministry in succession to Mr. L. J. Dunnett who, as recently announced, has been appointed Permanent Secretary. Mr. Hampson joined the Ministry of Supply in an administrative capacity in 1939. In 1945 he transferred to the Ministry of Transport as an Assistant Secretary in charge of organisation and methods. During the ensuing years he also served in the Marine Safety Division and on promotion to Under Secretary in 1954 took charge of the road transport and international inland transport group.

* * *

Mr. K. M. Davies has been appointed manager, commercial user sales, for the John Bull Rubber Co., Limited. Mr. R. D. Brown and Mr. D. Moore have been made commercial user sales executives.

* * *

At the annual meeting of the Mansion House Association on Transport on March 12, Mr. M. F. Barnard was re-elected president and other officers were also re-elected. Mr. J. W. Bannard was elected vice-president, Messrs. L. A. Castleton and B. V. G. Lewis were elected to the council.

* * *

Two British Transport Docks appointments are announced with effect from April 1. Mr. H. M. Mitton, portmaster at Grimsby and Immingham Docks, is made chief administrative officer at Euston headquarters and Mr. G. D. Fleming, assistant principal administrative officer, becomes administrative officer.

* * *

We regret to record the death of Mr. W. A. Howitt, who was private secretary to the late Lord Austin of Longbridge. He was 79. When Herbert Austin founded his own company in 1905 Mr. Howitt came with him, setting up his typewriter on a workbench and sitting on a packing case to write the first letters.

* * *

The annual general meeting of the Institution of Railway Signal Engineers, arranged for 6 p.m. on April 9 at the Institution of Electrical Engineers cannot now be held there owing to alterations to the building beginning earlier than was anticipated. The new venue is the Federation of British Industries, 21 Tothill Street, S.W.1, and the time will be 6.30 for 7 p.m. Tea will be served from 6.30 to 6.50 p.m.

During the visit of the Prime Minister to Northern Ireland he toured the Belfast works of Harland and Wolff. On his right here is Sir Frederick Rebbeck (chairman and managing director of Harland and Wolff), on his left Viscount Brookeborough, Prime Minister of Northern Ireland

Sir John Elliot, chairman of London Transport, talking at Bexleyheath Garage to the driver and conductor of the first bus to leave Bexleyheath in replacement of trolleybuses in that area

Mr. G. C. Draper, publicity manager, Aer Lingus, will join Central African Airways as traffic and sales manager on June 1. In his new post Mr. Draper will be head of the commercial division and will be responsible for the traffic, sales and publicity departments. He had been publicity manager of Aer Lingus since 1956.

* * *

The 1959 Motor Show, the 44th in the series, will be opened at Earls Court on October 21 and will remain open until October 31. For the first time there will be no display of boats or marine engines at the show, since the manufacturers concerned consider that their side of the industry will be adequately represented by the National Boat Show, to be staged at Earls Court in January, 1960. The caravan section will be unaffected.

* * *

The Board of Trade announces that Mr. J. C. Duckworth, B.A., A.M.I.E.E., will become managing director of the National Research Development Corporation on April 1 this year. This is a statutory appointment made by the Board of Trade under the Development of Inventions Act, 1948. Mr. Duckworth joined the then British Electricity Authority in 1954, with responsibility for the design, construction and operation of nuclear power stations, and is at present chief research and development officer of the Central Electricity Generating Board. The chairman of the N.R.D.C. is Sir William Black, managing director of Associated Commercial Vehicles, Limited.

* * *

Following the recent announcement of the appointment of Mr. R. Jarvie as managing director of United Dominions Trust (Commercial), Limited, further developments can now be reported. In future all the instalment credit business of the U.D.T. Group in England, Scotland and Wales will be handled by the Commercial company, whose board has been reconstituted. In addition to Mr. J. Gibson Jarvie as chairman and Mr. R. Jarvie as managing director, the board now includes three directors who are also on the board of the parent company, namely Messrs. D. Carmichael, P. M. Gray and Sir Brian Mountain, Bt., and three executive directors, Messrs. A. H. B. Bangham, L. Rosemont and W. W. A. Wallace.

* * *

We record with regret the death of Mr. A. E. Webster, who was a director and general manager of Hants and Dorset Motor Services, Limited, until he retired in 1949, and was, together with Mr. W. W. Graham, the founder of the company, responsible for its growth and development from a very small enterprise to the present large organisation operating bus services throughout Hampshire and Dorsetshire. Joining the company in 1919 after active service, he was first secretary then secretary and traffic manager during the difficult war and postwar years 1939-47 when, on the retirement of Mr. Graham, he was appointed his successor as director and general manager, holding this office until his retirement. Mr. Webster was 73.

The Southern Railway Dramatic Society scored another success with the Scala production of "The Reluctant Debutante" this week. We particularly liked Miss Joan Goodyear as Sheila Broadbent and Miss Peggy Pearce as her daughter Jane; David Bulloch was excellently portrayed by Mr. Alan J. Wood.

* * *

Mr. J. C. Gregory, transport manager of Bristol Aircraft, Limited, has been appointed works services manager, with wider responsibilities which include fire prevention, works police and security as well as supervision of transport and shipping. Mr. P. Alden, as transport controller, will be responsible for the day-to-day operation of the company's internal and external transport.

* * *

A new criminal investigation department is being formed by the British Transport Commission as part of the reorganisation of its police force. Mr. W. O. Gay, chief of police in the North Eastern Area of the force, has been appointed chief of police (crime) and Mr. M. G. Phillips, M.B.E., detective chief superintendent, Bristol Constabulary, has been appointed assistant chief of police (crime). Mr. J. Lawrence, chief constable of Reading, has recently been appointed chief of police in the Southern Area, located at Euston.

* * *

The London Midland Region of British Railways announces the following appointments:

Mr. J. Cornwell, to be assistant district goods manager (sales), Bolton.

Mr. R. E. Hardy, to be stationmaster, Birmingham New Street.

Mr. W. E. Preston, to be assistant to district operating superintendent, Manchester (N).

Mr. N. Cain to be assistant to district operating superintendent, Manchester (N).

Mr. H. Simpson, to be yardmaster, Basford Hall (Crewe).

Mr. M. C. Purbrick, to be assistant district engineer, Manchester.

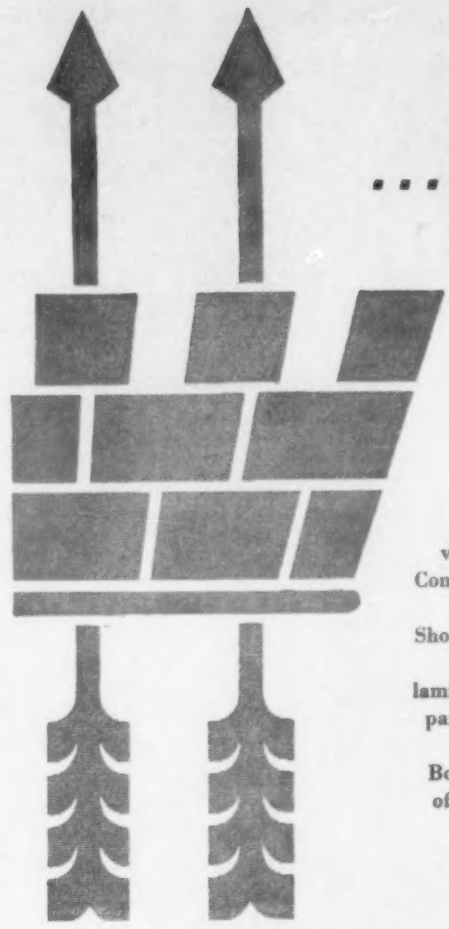
Mr. N. Liddle, to be stationmaster, Bolton.

* * *

Following his recent illness, Captain J. N. M. Weir has asked to be relieved of his appointment as chief of flight operations in the British Overseas Airways Corporation. He is succeeded by Captain T. H. Farnsworth, his deputy. Captain Weir is being appointed regional representative, South West Pacific. Dr. K. G. Bergin, at present chief medical officer, has been appointed director of personnel and medical services, also with immediate effect. Mr. H. Spear is relinquishing his appointment as chief personnel officer as from April 30.

* * *

Mr. R. W. Jackson has been appointed district goods manager, Glasgow, Scottish Region, B.R. Mr. Jackson joined the service of the former North Eastern Railway in 1921. In 1952 he was promoted assistant to district operating superintendent, Darlington. A year later he was appointed chief freight trains clerk in the operating superintendent's office, Scottish Region, and in February, 1955, became freight trains assistant to the chief operating superintendent. In September, 1956, Mr. Jackson was appointed district traffic superintendent, Ayr, and in February, 1958, district commercial manager, Edinburgh, the position he now vacates.



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The locomotives are being equipped with BTH mercury-arc rectifiers and associated transformers, traction motors, and the latest type of camshaft tap-changing control.

BTH are also working on another British Transport Commission order for thirty-five sets of a.c. electric equipment for multiple-unit stock, incorporating germanium rectifiers. This is the first bulk order of its kind in the world.

BRITISH THOMSON-HOUSTON

THE BRITISH THOMSON-HOUSTON CO LTD · RUGBY · ENGLAND

an A.E.I. company

AS259

IMPORTANT CONTRACTS

South Wales Docks

THE British Transport Commission had announced schemes of improvement and modernisation at the South Wales ports comprising Newport, Cardiff, Penarth, Barry, Port Talbot and Swansea, at a total estimated cost of £1,125,000. A programme of modernisation at No. 4 Quay, King's Dock, Swansea, is to be undertaken; and two diesel-driven grab dredgers are to be ordered in replacement of three obsolescent steam dredgers. The approach channels to the South Wales Docks, and in some cases the docks themselves, are subject to heavy siltation, involving continuous dredging. The scheme for the modernisation of No. 4 Quay at King's Dock, Swansea, includes the provision of nine new electric cranes with a radius of 70 ft. and on a gauge of 15 ft., the renewal of the crane track, the repaving of the quay flush in concrete, and additional railway facilities. The new cranes, which will replace obsolete hydraulic appliances of lower capacity, will comprise four units of 10-ton capacity for the discharge of bulk dry cargoes by grab, and five of 7½-4 tons capacity which will be used for the dual purpose of loading and discharging general cargoes and of discharging bulk dry cargoes. The electrification of the cranage on this quay will reduce the extensive hydraulic system at Swansea, and this will be further curtailed by the closing of the three existing hydraulic power stations and their replacement by five electric pumping stations located close to the appliances they will serve. Long stretches of hydraulic pipes radiating from the present power stations will thus be eliminated.

Gardner Engines in Far East

Norris, Henty and Gardners, Limited, is to supply a further 50 5LW 94-h.p. engines for the China Motor Bus Co., Limited. The contract for the chassis has been placed with Transport Vehicles (Daimler), Limited, and this will bring the total of Gardner-engined vehicles operating in Hong Kong and the adjacent Kowloon territory to approximately 550.

Aerlinte Orders Boeing 720s

Aerlinte Eireann (Irish Airlines) has ordered three Boeing 720 jet air liners—the overseas version—it was announced in Dublin last week. Delivery of the aircraft is expected in late 1960 or early 1961 and estimated capital cost of the three aircraft is approximately £1,200,000. The method whereby purchase of the aircraft will be financed is still under consideration between the Irish Government and the airline.

Engines for British Columbia Ferries

British Columbia Highways Department has ordered four large 3,000-h.p. diesel engines to power the Government ferries which are planned to operate the new service between Point Roberts and Sidney scheduled to begin in March, 1960. The order has been placed with Orenda Engines, Limited, one of the A. V. Roe Canada group of companies, and they will be built by Mirrless, Bickerton and Day, Limited. The value of the contract is $760,000. Two ferries are now under construction at Burrard Drydock, Vancouver, and at Victoria Machinery Depot, Victoria, and they are expected to be launched in July.

Tractors for Yugoslavia

An export order to supply Yugoslavia with £3,700,000 worth of machinery has been secured by two British firms. The order is for 5,000 Massey-Ferguson tractors and a wide range of implements, accessories and spare parts to be delivered to Industrija Traktora i Masina, of Belgrade. All the tractors will be fitted with engines manufactured by F. Perkins, Limited. Deliveries will be completed within 12 months. The order for engines has been placed with Perkins by Industrija Motora, of Belgrade. At present about 8,000 Massey-Ferguson tractors and more than 13,000 Perkins diesel engines are operating in Yugoslavia.

Repeat Orders for Atlanteans

A number of British transport undertakings are placing orders, many of them repeat orders, with Leyland Motors, Limited, for the Atlantean double-deck bus. The latest orders call for a further 120 and are valued at nearly £500,000. Previous orders for the Atlantean total over 350 buses. The latest contract has been from Trent Motor Traction Co., Limited; it is its third order and calls for a further 20. Companies also ordering for the third time are Maidstone and District Motor Services, Limited, calling for another 25 and East Midland Motor Services, Limited, with an order for five. Other orders have been placed by Potteries Motor Traction Co., Limited, for 40; Northern General Transport Co., Limited, for 11; and for its associated companies, Gateshead and District Omnibus Company for 10, Tynemouth and District Transport Co., Limited, for five and Sunderland District Omnibus Co., Limited, for four.

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TENDERS INVITED

THE following items are extracted from the Board of Trade Special Register Service of Information. Inquiries should be addressed, quoting reference number where given, to the Export Services Branch, Board of Trade, Lacon House, Theobalds Road, London, W.C.1.

March 24—Union of South Africa.—South African Railways for COMPONENTS FOR DIRECTION INDICATORS. Tenders to the Chief Stores Superintendent, South African Railways, P.O. Box 8617, Johannesburg. (ESB/8112/59.)

March 25—Belgian Congo.—Ministry of Belgian Congo and Ruanda-Urundi, Brussels, for supply of two MOTOR COMPRESSORS and one four-by-four 7-ton TRUCK. Tenders to Ministere du Congo Belge et du Ruanda-Urundi, 1 rue de la Regence, Brussels. (ESB/6211/59.)

March 28—Iraq.—Directorate General of Municipalities for the supply of a FIRE VEHICLE to Najaf Municipality. Tenders to the Directorate General of Municipalities, Baghdad. (ESB/6342/59.)

March 28—Iraq.—Directorate General of Municipalities for the supply of a VEHICLE for sprinkling water and fire protection to Mahaweel Municipality. Tenders to the Directorate General of Municipalities, Baghdad. (ESB/6344/59.)

March 28—Iraq.—Directorate General of Municipalities for the supply of a FIRE VEHICLE to Hilla Municipality. Tenders to the Directorate General of Municipalities, Baghdad. (ESB/6343/59.)

March 30—Thailand.—International Co-operation Administration (I.C.A.) procurement for three oilfield type, four-wheel drive, TRUCKS with minimum gross-carrying capacity 14,000 lb.; three heavy-duty four-wheel drive SERVICE TRUCKS with minimum gross carrying capacity 14,000 lb.; five four-by-four PICK-UP TRUCKS with 122- to 126-in. wheelbase, and three four-by-four 126-in. wheelbase PICK-UP TRUCKS. Tenders to Thai Technical and Economic Committee, 962 Krung Kasem Road, Bangkok, Thailand. (ESB/6801/59/ICA.)

Argentina.—The Argentine State Railways contemplates the issue of a public call for tenders for the electrification of the General Roca Railway (formerly the B.A.G.S.). At this stage the State Railways is asking for comments and suggestions from firms specialising in this kind of work. The area to be electrified has a total of 132.1 km. of route and 305.4 km. of single-track main line. (ESB/3478/59.)

SHIPPING and SHIPBUILDING

Tax Relief Unavailing

IN present circumstances tax relief for shipping companies is largely unavailing because of the absence of taxable profit. The relief which has already been given and gratefully acknowledged in the form of investment allowances cannot be fully operative until the lean years have passed. These were some of the points made by Sir A. Harold Bibby, chairman, when he introduced the annual report of the Liverpool Steam Ship Owners Association at the annual meeting on Tuesday this week. "The truth is," Sir Harold Bibby added, "that so much damage has already been done through the drain of past taxation levied on us in times when tax-free competitors of ours have been able to retain all their profits for the building of ships and the accumulation of reserves. Our submissions in this regard are before the Government and we await the outcome of them, hoping that it will be removal of this handicap, so that when better times again come we shall be able to compete on level terms." At the meeting Mr. A. Rigby Hughes, managing director of Thos. and Jno. Brocklebank, Limited, was elected chairman for the ensuing year and Mr. R. Stewart MacTier, partner in Alfred Holt and Company, vice-chairman.

Flags of Convenience Conference

EUROPEAN maritime nations will discuss flags of convenience and other shipping matters with the United States at a conference to open in Washington on June 8. Representatives of Britain, Belgium, Denmark, France, Italy, the Netherlands, Norway, Sweden and West Germany will attend the meeting.

St. Lawrence Seaway Tolls

TOLLS on ships using the $451 million St. Lawrence Seaway will be less than those imposed on Suez and Panama Canal shipping, the U.S. and Canadian Governments have confirmed. A ship moving through the entire seaway will pay 6 cents for each gross registered ton of the vessel. One registered ton is figured as 100 cu. ft. A toll of 42 cents a ton will be charged on bulk cargo and 95 cents on each ton of general cargo. For each passage between Montreal and Lake Ontario the charge will be 4 cents a registered ton, plus 40 cents on each ton of bulk cargo and 90 cents for general cargo.

Largest Tanker Built in Europe

THE s.s. *W. Alton Jones*, launched on March 7 at Uddevalla in Sweden, will be the largest tanker yet built in Europe. The vessel, of 69,000 tons deadweight and 824 ft. overall, is being built by Sorviksvarvet A.B. for Ships, Inc., a subsidiary of Cities Service Company, one of the leading oil companies in the United States. She will attain a speed of 16 knots and is the first of a new series of three supertankers to be built by the Swedish company for use in the Cities Service tanker fleet in transporting crude oil from distant ports to the east coast of the United States. A feature of the hull form is considerable sheer forward of the midship house to give the ship better seagoing qualities, especially during North Atlantic winter storms. The ship will be air-conditioned throughout.

Radio for Great Lakes Service

INSTALLED in the new cargo liner *Manchester Faith*, 3,800 tons, of Manchester Liners, Limited, is a wide range of Marconi Marine communications equipment and radio aids to navigation, including a special radiotelephone installation for use in the St. Lawrence Seaway and Great Lakes area. Built at Sunderland by Austin and Pickersgill, Limited, the *Manchester Faith* is one of two vessels specially designed for trade between the United Kingdom and the Great Lakes area through the St. Lawrence Seaway. A Marconi Marine Fulmar transmitter and Guardian II receiver will provide radiotelephone facilities in the Great Lakes and on the U.S. and Canadian coasts generally; and appropriate frequencies are available to enable the same equipment to be used in European waters. The radiotelephone service will be required during canal transit in the St. Lawrence Seaway, and the equipment is installed in the wheelhouse to comply with the requirements of the U.S.—Canadian Great Lakes Commission.

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FINANCIAL RESULTS

NOTES on the trading results, dividends and financial provisions of companies associated with the transport industry are contained in this feature, together with details of share issues, acquisitions and company formations or reorganisations.

Consolidated Signal

Net profit of the Consolidated Signal Co., Limited, for the year ended September 30, 1958, was £45,387 (£45,213). Dividend on the ordinary stock is 40 per cent (same).

Ford Motor

The Ford Motor Co., Limited, is distributing a final dividend of 5½ per cent on the ordinary capital for 1958, making a total of 9 per cent. Also, there is a special non-recurring interim dividend of 3 per cent in respect of 1959. Trading income in 1958 totalled £24,691,514 (£18,642,573) and group net income, after tax, was £13,320,558 (£11,036,509). Total sales were £206.6 million (£165.9 million).

Transport Development Group

Transport Development Group, Limited, is paying a final dividend of 7½ per cent on the ordinary shares for 1958. A distribution on the ordinary shares of 1 per cent tax free out of capital profits is also being recommended. In addition, the directors have declared a special non-recurring interim dividend of 2½ per cent on the ordinary in respect of the year 1959. Total ordinary dividend for 1958 is 16 per cent (12½ per cent). Group profits for the year after all charges but before depreciation and taxation were £607,494 (£504,911); group profit after taxation and depreciation £208,580 (£150,278).

North British Locomotive and G.E.C.

At an extraordinary meeting of the North British Locomotive Co., Limited, on March 16, Mr. T. A. Crowe, chairman, said the prospects were brighter; there was now a full order book worth £14 million while prospects of further orders over the next few years were promising. The directors also felt they were gradually surmounting the many problems that had arisen from the complete changeover from steam to diesel. The link with the General Electric Co., Limited (which has put up £500,000 of finance), should pave the way to a broadening of the business so that in the years ahead the company would not be so dependent on one industry.

Sinclair and B.P. Sales

British Petroleum and Sinclair Oil have now set up the joint marketing company which is part of the threefold agreement between the two companies announced last October. The new company, Sinclair and B.P. Sales, will market crude (B.P. from the Middle East and Sinclair from Venezuela) in the Western Hemisphere. B.P. already has a long-term contract to deliver oil to meet Sinclair's domestic needs in the U.S., where the company's refining capacity can take twice as much as the 10 million tons a year it produces. Until imports can enter the U.S. more freely, the new company will look principally to Central and South America for a market for crude which it will take either from Sinclair or B.P. sources according to price, grade and other market conditions.

SUCCESS STORY!

for B.U.T. powered MULTI-CAR DIESEL TRAINS

operating on British Railways

BRADFORD - LEEDS - HARROGATE

Annual receipts under steam of £23,000

increased under diesel multiple units to £116,000

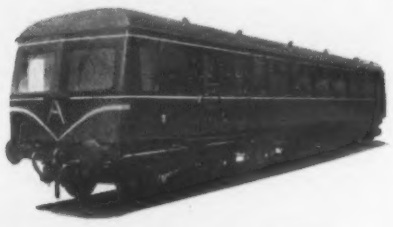
NEWCASTLE - MIDDLESBROUGH

In 1955 deficit of movement costs of −£10,000

by 1958 becomes a surplus with diesel of +£137,000

EDINBURGH - GLASGOW
Inter City

During the first year of operation, this diesel service carried 700,000 extra passengers.



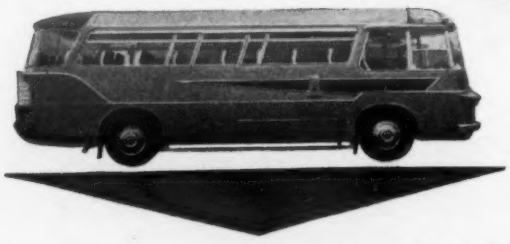
Examples of improved receipts quoted by the Minister of Transport and Civil Aviation to the House of Commons on Thursday, December 11th, 1958.

BRITISH UNITED TRACTION LTD. 96 PICCADILLY, LONDON, W.1

The World's Largest Suppliers of Diesel Train Units.

Mulliners 'new style' luxury coach

Fine bodywork welded by *Saturn-Hivolt*



Surge Injector Welding Units

Notable always for the highest standard of bodywork, Mulliners recently announced their latest achievement—the "New Style" luxury coach. In this, as in many previous models, Saturn-Hivolt Surge Injector Welding equipment and Saturn Argon are used for the many important welding operations. Saturn cutting and welding equipment has for many years played a big part in industry. The new Saturn-Hivolt Surge Injector Argon Arc Welding machines offer the finest welding of aluminium and its alloys, and stainless steel. Let us show you the complete range supplied and maintained from our many branches throughout the country. We also offer daily deliveries of a wide range of industrial gases.

SATURN INDUSTRIAL GASES LTD

GORDON ROAD, SOUTHALL, MIDDLESEX

TELEPHONE SOUTHALL 5611

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MCW

Madrid Municipality use 100 of these MCW single-deck three door buses, and over 200 MCW bodies of all types have been, or are being, supplied.

The World's most popular Bus Bodies

Thirty-eight MCW front engine double-deck buses are being supplied to Lisbon Tramways, making a total of over 200 MCW bodies for this Company.

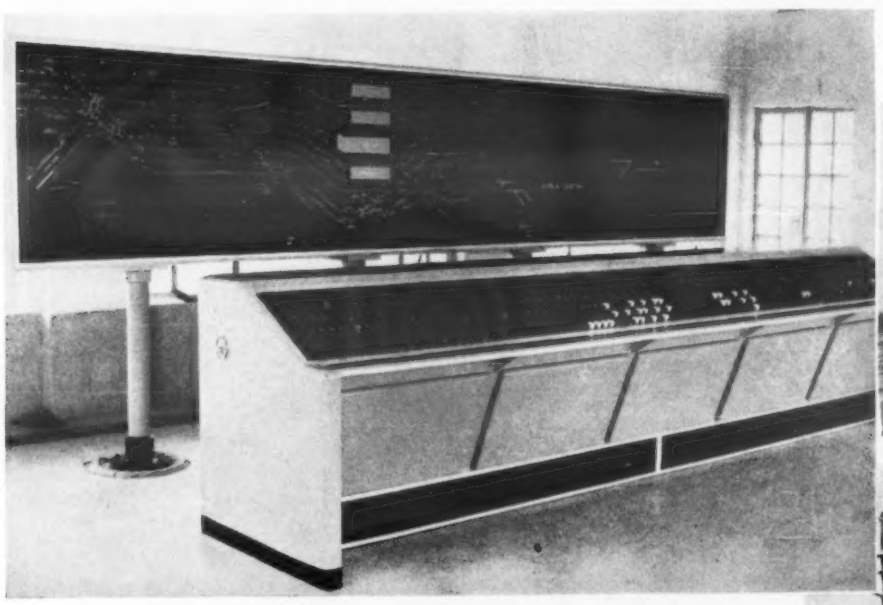
MCW Series 2 Olympic, one of over 150 MCW buses for the Jamaica Omnibus Company.

METROPOLITAN-CAMMELL-WEYMANN LIMITED

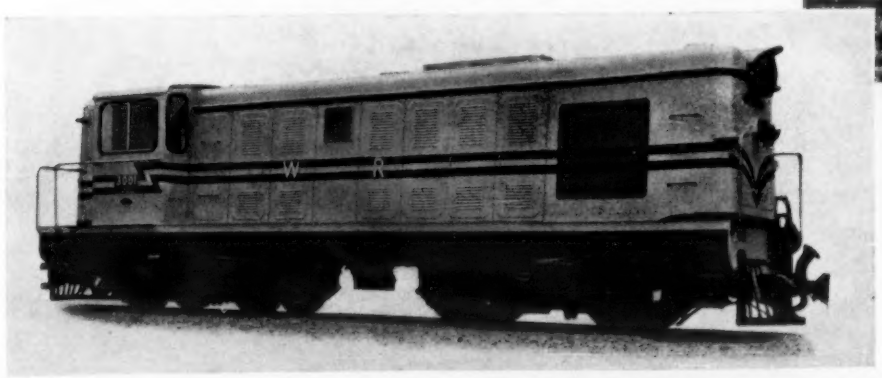
VICKERS HOUSE · WESTMINSTER · LONDON · S.W.1

AP192

KEEPING TRAINS MOVING IN INDIA



The first major modern signalling of its kind in India—KURLA—the busiest junction station of the Central Railway of India, a Westinghouse O.C.S. Power Signal Installation (125 route switches and 53 point operation switches, 1100 plug-in relays) handles at present 600 trains daily and is designed for increase in traffic.



Some modern Indian Locomotives fitted with WESTINGHOUSE VACUUM/AIR BRAKES

TOP: One of twelve 3120 h.p. electric locomotives for Eastern Railway. Built by The English Electric Co. Ltd.

CENTRE: One of seven 3600 h.p. electric locomotives for Central Railway built by The English Electric Co. Ltd., and Vulcan Foundry Ltd.

LEFT: One of twenty 625 h.p. diesel electric locomotives for Western Railway built by North British Locomotive Co. Ltd.

WITH

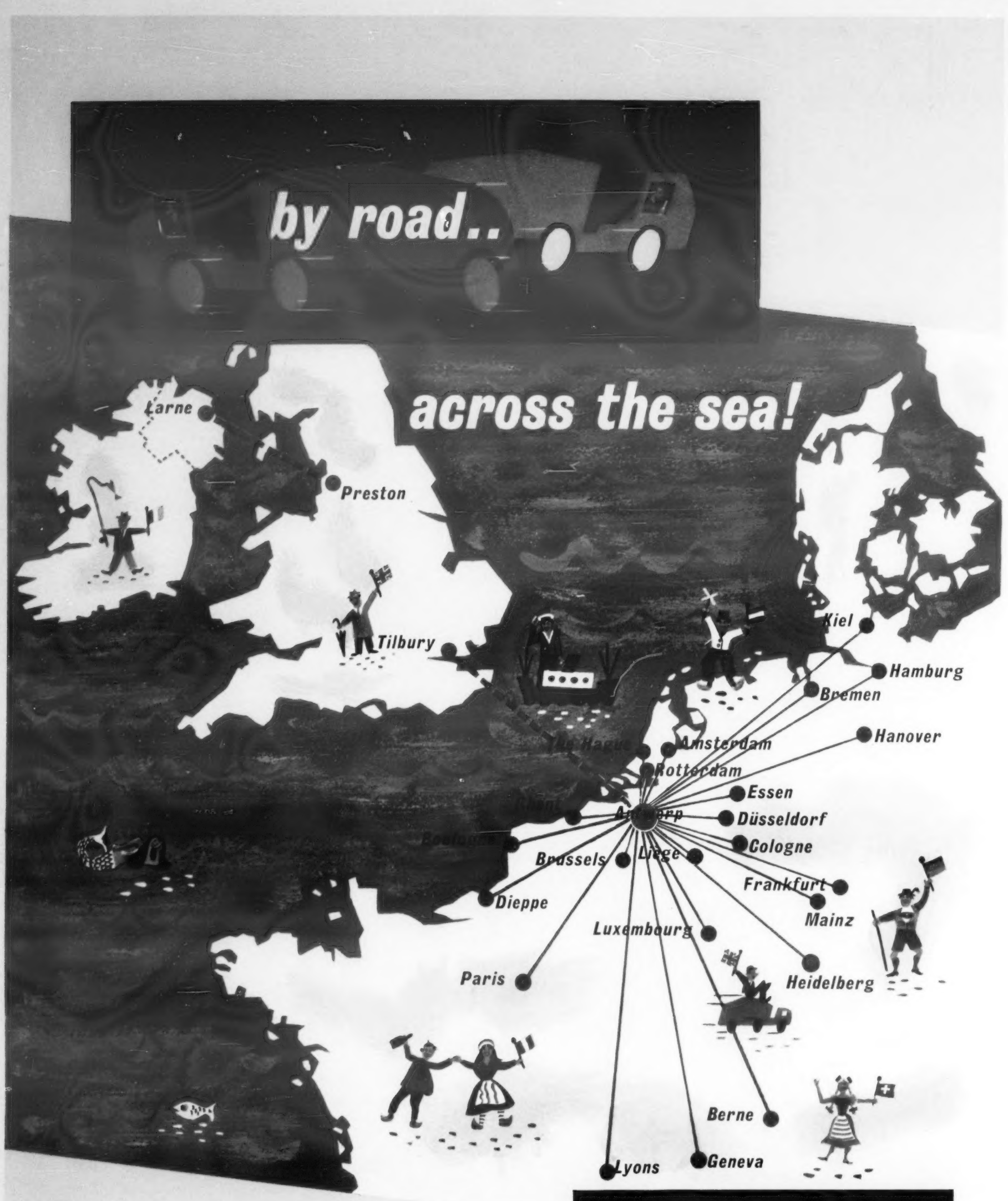
WESTINGHOUSE

BRAKES & SIGNALS

Westinghouse Brake and Signal Co. Ltd., 82 York Way, London, N.1

Saxby & Farmer (India) Private Ltd., Calcutta — McKenzie & Holland (Australia) Pty., Ltd., Melbourne

Westinghouse Brake & Signal Co. S.A. (Pty.) Ltd., Johannesburg. *Agents:—Bellamy & Lambie, Johannesburg*



Continental ferry service

Regular sailings between Tilbury and Antwerp provide a through road service between Great Britain and Belgium, France, Germany, Holland, Luxembourg and Switzerland, and, by arrangement, with certain other Continental countries.

Irish ferry service

Regular sailings between Preston and Larne provide a through road service between Great Britain and Ireland.

by
BRITISH ROAD SERVICES

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